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THE FLORA OF COCKBURN ISLAND, ONTARIO, CANADA

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ABSTRACT

The vascular flora of Cockburn Island, Ontario, Canada, was inventoried, previous collecting sources combined, and the nomenclature updated. Cockburn Island lies on the Niagara Escarpment between Drummond Island, Michigan, U.S.A. and Manitoulin Island, Ontario, Canada; hence limestone dictates most of the substrate of the island. The plants currently on the island reflect the activities of the owners of the past 135 years, in which the island has gone from wilderness, to partially farmed and timbered land, and its eastern portion was burned. Since 2012, a large portion is preserved, having been purchased by the Nature Conservancy of Canada. All of these changes have affected the flora. A total of 644 species of vascular plants in 103 families and 337 genera are now known from the island, including 112 non-native species. Old and new invasives were tracked and eradicated whenever possible. The island contains 22 natural plant communities, two complex natural areas made up of multiple plant communities, and eight artificial habitats. A plant list has been compiled for each habitat. The author collected 48 species that were new to the island and 20 additional species that had previously been reported but that are not common. The following species of conservation concern were collected on the island for the first time: *Adlumia fungosa* (Michigan special concern), *Botrychium lanceolatum* (Ontario vulnerable), *Calypso bulbosa* (Michigan threatened), *Cypripedium arietinum* (Michigan special concern), *Cystopteris laurentiana* (Michigan special concern), and *Drosera anglica* (Michigan special concern). In addition a collection of *Packera obovata* represents a new northwestern limit of the range of this species. *Pterospora andromedea* (Michigan threatened) was collected on the island for the first time since 1870. A quantitative analysis was made for the eastern limit of the 'straits strain' of *Solidago houghtonii* (Michigan threatened).

KEYWORDS: Flora of Cockburn Island, Ontario, Canada, Vascular Plants, Natural and Artificial Plant Communities.

INTRODUCTION

Cockburn Island, Ontario, Canada, lies on the Niagara Escarpment between Drummond Island, Michigan, U.S.A., and Manitoulin Island, Ontario, Canada (Figure 1). Plant collecting has been limited previously to coastal areas accessible by boat and to the main road system that is accessible by car or truck. Presented here is a brief historical, physical, and ecological description of Cockburn Island, an analysis of the many habitats found on the island, and a checklist of the vascular plants that have been collected there. Cockburn (pronounced Co-burn) Island is located five miles east of Drummond Island, which lies at the eastern tip of the Upper Peninsula of Michigan. To the north lies the North Channel; to the south is Lake Huron; to the west is Drummond Island on the False Detour Channel (named for the mistake the early surveyors made in giving adjacent Drummond Island to the United States); to the east is the Mississagi Strait and, about three miles away, Manitoulin Island.

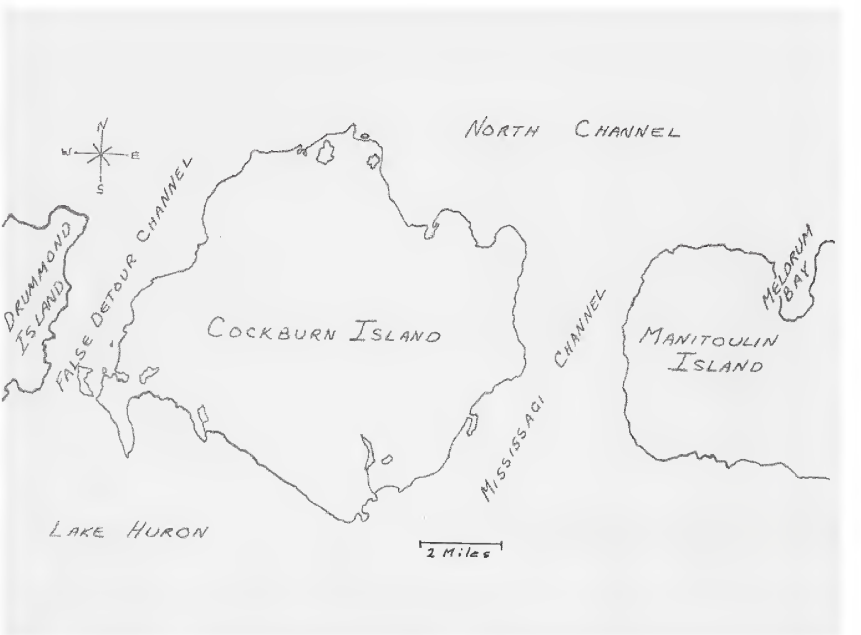

FIGURE 1. Position of Cockburn Island in the North Channel between Drummond Island, USA, and Manitoulin Island, Canada. Map is taken from *Yonder Our Island* (MacDonald 1979) and reprinted with permission of the Cockburn Island Council.

Cockburn Island is within the cool temperate ecoclimatic region that is characterized by cool winters and warm summers (Strong et al. 1989). Ice often forms all around the island, except occasionally in the False Detour Channel and the Mississagi Strait. Fire, water, and wind are significant factors in making frequent alterations to the landscape, and thereby to the flora (Pulfer and Grant 2012).

Since Cockburn Island is located between two larger islands that have frequently been visited by botanists, the author took an interest in discovering what plants and habitats could be found on this much smaller island between the larger ones. The area of Cockburn Island is 66.039 square miles (Government of Canada 2011), whereas that of Drummond Island is 128.908 square miles (United States Census Bureau 2013), and that of Manitoulin Island is 1199.7 square miles (Government of Canada 2011). Drummond Island and Manitoulin Island each contain large amounts of exposed limestone and dolomite cliffs and alvars, whereas the cliffs and alvars of Cockburn Island are often covered with glacial drift or are hidden by forest.

Most of Cockburn Island is under the jurisdiction of the Township of Cockburn. The Zhiibaahaasing Band, a First Nation community from Manitoulin Island, owns the Cockburn Island Indian Reserve No. 19, which is located in the northwestern part of Cockburn Island. The offshore islands are included politi-

cally within Manitoulin Island. Cockburn Island was named for Sir Francis Cockburn, a distinguished soldier and settlement officer who served in Canada from 1811 to 1823 (MacDonald 1979).

In December 2012, the Nature Conservancy of Canada (NCC) completed a purchase of 24,000 acres, constituting over half of the island. With respect to that purchase, NCC noted that

> [t]he property has an incredible 41 kilometers of undeveloped shoreline and, as a result, has become the largest protected hardwood forest in southern Ontario. . . . Along with its sister islands, Manitoulin and Drummond, Cockburn Island features an incredible variety of globally significant species and plant communities—the richest of any region within the Canadian portion of the Great Lakes Basin. In an international study of 32, 000 islands in the Great Lakes, Cockburn Island ranked 10th for its conservation importance, lack of disturbance and threat of development. . . . While the island was opened up for agriculture in the late 1800s, its isolation resulted in the abandonment of many farmsteads. Today the island has no permanent population, which makes this conservation all the more important and rare.
>
> (Nature Conservancy of Canada 2015).

GEOLOGICAL HISTORY

Features created by geological events dominate the topography of Cockburn Island. Ordovician limestone was formed under a tropical sea some 450 to 500 million years ago. Silurian dolomite was then laid down from deposits left behind by an ancient sea in the mid-Silurian period, about 425 million years ago. Both types of limestone can be found on Cockburn Island. These limestone substrates form a long northward-arching escarpment, or ridge, from the Door Peninsula of Wisconsin through Niagara Falls in New York. The Silurian stratigraphy on Cockburn Island was studied by Kelley (1949). He concentrated on 20 sites in the northern part of the island that had exposed limestone outcrops or flat beds of limestone. He found many fossils and divided the island into four main formations: Engadine, Manistique, Burnt Bluff, and Dyer Bay. Water-eroded limestone cliffs and alvars of the escarpment circle much of the island, roughly paralleling the shores and situated slightly inland. This tough limestone contains deep fissures that are good habitats for ferns. It also weathers into tiny potholes about an inch across, making productive places for seedlings to take hold in the accumulating duff and water.

The Wisconsin glaciation reached its peak about 20,000 years ago with an ice sheet over a mile thick that covered Cockburn Island. McCaig's Hill (elevation 950 feet) in the center of the island is a kame formed when glacial debris consisting of a wet slush of gravel and sand poured through an opening in the melting ice. "A central hill of morainic till, with surface reworking by glaciolacustrine beach processes, is surrounded by approximately concentric glacial beaches and wave-cut-terraces. Bedrock outcrops are confined to the northern part of the island" (Wolf 1986). The tip of McCaig's Hill is the only portion of the island that was above water during the Algonquin period, about 11,800 years ago; the water level at that time was about 400 feet higher than it is at present (Chapman and Putnam 1984). Gradually more of the island became exposed as the Earth's

crust rebounded from the weight of the ice. As the water gradually receded, it left a series of boulder terraces of "massive gravel strands" (former beach ridges) leading down from the McCaig's Hill kame. Water levels lowered, and then rose again, until about 6,000 years ago, when the water levels were "well above their present lake level." This period of time, known as the Nipissing period, continued until about 4,000 years ago. Gradually lake levels lowered again until they were about 25 feet above present normal levels. Rebound continued at a rate of about one foot per century, so that between the rebound and the lowering of the lake level, any land that is now below roughly 75 to 80 feet above the current lake level (Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data 1992) would have been submerged during the Nipissing period and would have emerged as dry land only within the past 4,000 years (Morton and Venn 2000). A good example of the dramatic drop in the lake levels is visible on the Munday Bay Trail, where the steep cliff demonstrates the lower Nipissing level (Figure 2).

There are many small, unnamed lakes on Cockburn Island and two larger named lakes—Robb Lake and Sand Lake. With the exception of Sand Lake, where the lake level is artificially elevated as a result of both a small man-made dam and a beaver dam, the lakes are shallow. Extensive areas of sand plains are forested (Kelley 1949), and there are remnant inland sand dunes north of the pre-

FIGURE 2. Munday Bay Trail: steep Nippising drop-off from upland woods (*Acer saccharum* and *Populus tremuloides)* into rich conifer swamp. Pictured are Jack LaBossiere and Heidi (field assistants). September 1, 2010.

sent-day beaches on the south shore. Most of the glacial erratics are of Precambrian origin derived from the Canadian Shield to the north (Chapman and Putnam 1984). Five smaller islands are in close proximity to Cockburn Island—Herschell, Kitchener, and Little Kitchener to the southwest; Avis to the north; and Magnetic to the southeast. Numerous shoals lie to the south in Lake Huron; they are made up of sand and gravel dragged there as glacial debris when glaciers raked across the main island. At times of low water levels, these shoals are readily visible and are hazardous to boats attempting to navigate there.

OCCUPATION HISTORY

First Nation people of the Ottawa tribe have occupied Cockburn Island from time to time for much of the past several thousand years. An Upper Canada Governor's treaty in 1836 gave the First Nation people the right to "sole use" of the Manitoulins (which included Cockburn Island). In 1862, the treaty was abrogated in order to make the land available to settlement, and by the end of the 1870s, the Department of Indian Affairs was selling 100-acre parcels to settlers for $0.50 an acre (MacDonald 1979). The Zhiibaahaasing First Nation community on Manitoulin Island owns the Cockburn Island Indian Reserve No.19 and lived there for many years. Currently, however, no First Nation people live on the island, although members of the Manitoulin band make periodic visits.

White settlers, many from Scotland, have occupied Cockburn Island since about 1879, although the year-round population is now one person, but others occasionally spend the winter. The Township of Cockburn Island was formed in 1881, and a government dock was erected to aid in natural resource development, particularly in the forest industry. Settlers cleared the land and sold extra produce and livestock to the many lumber camps that were scattered through "the bush." A patent, or deed, could be obtained on 100 acres of land if the taker agreed to build a house at least 18 by 24 feet in area and to cultivate at least five acres of land within three years. Horses and a few oxen were used for farming and transportation. In a poignant but succinct comment, it was written, "[I]n addition to timbering, [the settlers] . . . also did what little farming the rapidly depleted soil would permit. The soil that appeared so fertile when first farmed quickly lost its top layer of soil, leaving sand behind." According to the 1891 census, the population of the island was 209. Based on Cockburn Township taxpayer records for 1919 and 1922, the population at that time had increased to around 500 white people living on the island full time, around 50 First Nation people living in the Indian Reserve, as well as men who worked in the bush on a more temporary basis (Harold J. McQuarrie and Paul Perigord, island historians, pers. comm.). Within 100 years, agriculture and timber production had declined, fishing was not as good, and men and older boys were called to serve in World War II. By the time the weekly ferry that ran during the ice-free months stopped running in 1969, most of the island residents had moved off the island (MacDonald 1979).

Logging companies have owned a large portion of the island since the late

1800s, so there is very little virgin timber left. The Huron Timber Co. owned about 85% of the land until the Nature Conservancy of Canada's purchase of 24,000 acres in 2012. The Huron Timber Co. has retained 9000 acres and has been working selected parts of the island, cutting both hardwood and *Thuja occidentalis* (Northern White Cedar) as the market demands. Periodically, new haul roads are built to reach some of the more isolated timber stands, although there are still many parts of the island that have not been recently harvested. Trees on the island are tall and healthy, and saw mills on the mainland prefer to have cedar trees from the island because the trees tend to have solid heartwood. It is thought that the influence of the limestone bedrock, in addition to the favorable growing conditions, adds to the health of the trees. *Betula papyrifera* (Paper Birch) is often left standing after timbering, and clonal sprouting in the cutover areas by *Populus balsamifera* (Balsam Poplar) and *P. tremuloides* (Quaking Aspen) results in large areas of dense, equal-age saplings.

The township owns a 66-foot marine allowance and a 66-foot road allowance all around the island except in the Indian Reserve. The road allowance is double in the small town of Tolsmaville, the only town on the island. The Ministry of Natural Resources purchased a small amount of land in the southwest corner of the island several years ago.

METHODS

Numerous botanical survey trips to Cockburn Island were made from the spring of 1997 through the fall of 2014. The earliest visits in any given year were April 1, and the latest was in mid-November. There were an average of six trips per year, each lasting five days to three weeks. A thorough search of the island flora has been made, to the extent allowed by the limited road and trail system. Surveys were made in any available vehicle, and several were made by small boat in order to land at remote areas. Other trips were made by foot or, to cover long trail distances, in an off-road vehicle (ORV). As different habitats were encountered, each area was walked thoroughly, with repeated surveys throughout the growing season. New sites were added as a result of information obtained from islanders, by searching Google Earth maps (Google 2013) for potential localities, by examining an unpublished hand-drawn Forest Type Map created by the Ontario Paper Company, and by chance when exploring new trails and old homestead lanes. Whenever possible, plants were collected in flower or fruit in meander surveys to cover as much territory as possible. Herbarium specimens are deposited in MICH, after having been verified for identification by Anton A. Reznicek, curator at the University of Michigan Herbarium. Since the island was visited throughout the growing season, collecting throughout a wide range of flowering and fruiting times was possible. Plants previously documented on Cockburn Island by Morton and Venn (2000) were not particularly sought, since the Canadian experts who work for the Ministry of Natural Resources (MNR) and the Natural Heritage Information Centre (NHIC) had already documented their existence. Rare or sporadic plants were noted to learn about their current distribution, and non-native species were sought in order to document their arrival and distribution patterns.

A map of the island made by Harold J. McQuarrie (McQuarrie 1999) is extremely helpful when traveling around the island, since it identifies the road system, trails, place names, ownership, lakes, and creeks, although ownership of some properties has since changed and new logging roads have been added.

The use of resources by the islanders was determined by means of numerous personal observations and discussions and correspondence with islanders. Casual wildlife observations were noted, especially when wildlife had an impact on the vegetation or the people of the island. Animal taxonomy is taken from Banfield (1974) and fish taxonomy from Smith (2004).

HISTORY OF BOTANICAL EXPLORATION ON THE ISLAND

Robert Bell and his brother, Dr. John Bell, who collected on the island during the 1860s, made the earliest known botanical collections on Cockburn Island (Morton and Venn 2000). Their collections were housed in The Carleton University Herbarium (CCO), which, in 2005, was added to the Agriculture and Agri-Food Canada Herbarium (DAO). In 1932, C. O. Grassl and W. Koelz visited the island and made collections, some of which are in MICH (Anton Reznicek, pers. comm.). Previous collectors concentrated on the areas to which they could easily gain access, especially around the shores. Early collecting sites included Rickett's Harbor, Sand Bay, Boom Point, and Wagosh Bay along the southern shore and on the north and east shores were Munday's Bay, Otter Bay, Robinson Bay, and the Williton Dump (where logs were dropped down a steep slope to access water). Early botanists also made collections along some of the island network of roads. Additional roads are now open that were not available when some of the earlier collectors visited the island. These roads are passable by regular car, although fast-moving logging trucks also use them. Trails that are passable by foot or by ORV connect many of the remote shore areas, as there are only two public shore areas that are easily reached by car or truck: the Otter Bay area of the village and Sand Bay on the south shore.

Morton and Venn (2000) indicated on their distribution maps the species collected from Cockburn Island through 2000, derived in large part from their extensive botanical expeditions to the Island that began in the early 1970s. Distribution maps for each species in Morton and Venn (2000) indicate by a dot each of nine sections of Cockburn Island where they documented that species. This has been of immense assistance in the conduct of the current study. Herbarium specimens collected by Morton and Venn (and others) were originally housed in WAT, but have since been moved to MT. Michael Oldham, Wasyl Bakowski, and K.E. Brodribb of the Ontario Ministry of Natural Resources and Forestry's Natural Heritage Information Centre (NHIC) and Judith Jones, a private consultant, made a collecting trip to Cockburn Island in 2003. In 2014. Michael Oldham, Judith Jones and Sam Brinker, also of the NHIC, attended the NCC Expert's Weekend and did further collecting. Mike and Judith concentrated on Wagosh Bay, while Sam Brinker and the author collected in other parts of the island. Sam Brinker provided a list of the plants collected or seen on these trips, and the species not otherwise known from the Island were added to the annotated checklist in the Appendix.

RESULTS

Summary of the Flora

The result of the present survey and the NHIC surveys, when added to the species previously documented in Morton & Venn (2000), is a total of 103 plant

TABLE 1. Number of families, genera, and species on Cockburn Island for each of the major groups of plants.

Group	Families	Genera	Species
Pteridophytes	11	20	47
Gymnosperms	3	8	15
Monocots	17	73	173
Dicots	72	236	409
TOTALS	103	337	644

TABLE 2. Number of total species and non-native species in each of the ten largest families on Cockburn Island.

Family	Total Species	Non-native Species
Asteraceae	76	26
Cyperaceae	57	0
Poaceae	48	9
Rosaceae	39	8
Orchidaceae	24	1
Brassicaceae	20	10
Ericaceae	20	0
Salicaceae	16	3
Caryophyllaceae	12	8
Fabaceae	12	8

families, 337 genera, and 644 species, including 112 non-native species. These are listed in the Appendix.

Table 1 lists the number of families, genera, and species for the four major groups of plants. Table 2 provides the number of total species and non-native species of the ten largest families on the Island. Slightly less than 18% of the total flora consists of non-native species.

Forty-eight species that were new to the island were collected during the present survey, including four pteridophytes, two gymnosperms, six monocots, and 36 dicots. Twenty additional species that had already been reported but are not common were also collected, including one pteridophyte, nine monocots, and 10 dicots. Among these was *Pterospora andromedea* (Pine-drops), which had been found on the Island only once previously, in 1870, and for which the author found a new locality.

Distinctive Great Lakes Region Shoreline Plants

Cockburn Island contains a number of plants that are considered distinctive Great Lakes region shoreline plants by Guire and Voss (1963), who divide these plants into endemic species, coastal species, western species, northern species, and species with miscellaneous distributions. Among these, three of the Great Lakes endemics are found on the Island: *Carex scirpoidea* subsp. *convoluta* (Scirpus-like Sedge); *Cirsium pitcheri* (Pitcher's Thistle) (Figure 3); and *Solidago houghtonii* (Houghton's Goldenrod) (Figure 4). *Iris lacustris* (Dwarf Lake

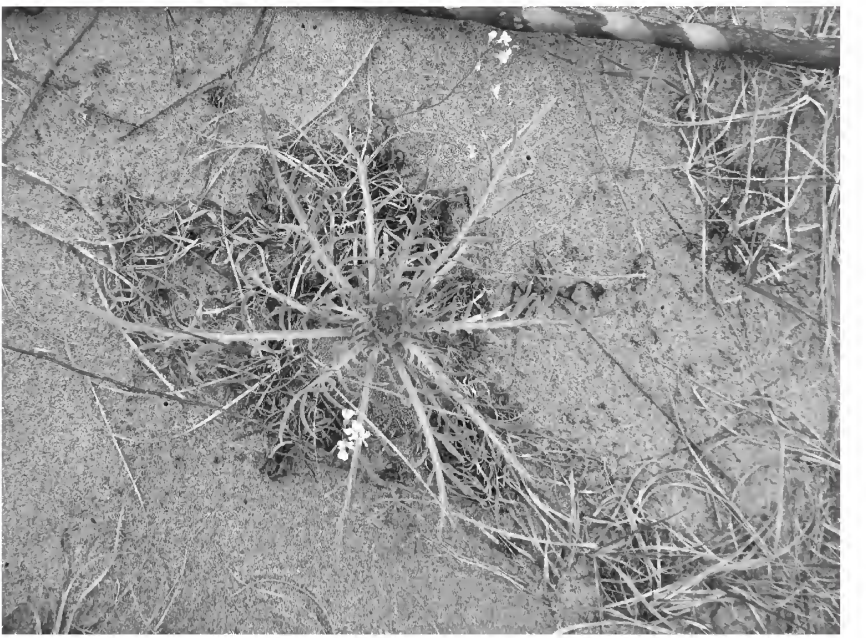

FIGURE 3. *Cirsium pitcheri* in bud on Doc Hewson Bay. June 1, 2007.

Iris) was sought but not found, although it is present on both Drummond and Manitoulin Islands. Four of the six coastal species are present: *Ammophila breviligulata* (Beach Grass; Marram Grass), *Cakile edentula* (Sea Rocket), *Lathyrus japonicus* (Beach Pea), and *Tanacetum bipinnatum* (Lake Huron Tansy). Three of the five western species are present: *Calamovilfa longifolia* (Sand Reed Grass), *Elymus lanceolatus* (Wheat Grass), and *Corispermum americanum* (Bugseed). Four of the five northern species are present: *Anemone multifida* (Red Anemone), *Parnassia parviflora* (Grass-of-Parnassus), *Primula mistassinica* (Bird's-eye Primrose), and *Selaginella selaginoides* (Northern Spike Moss). Six of the eight plants with miscellaneous distributions are present: *Carex crawei* (Early Fen Sedge), *C. garberi* (Garber's Sedge), *Clinopodium arkansanum* (Limestone Calamint), *Hypericum kalmianum* (Kalm's St. John's-wort), *Juniperus horizontalis* (Creeping Juniper), and *Salix cordata* (Sand-dune Willow).

Plants of Conservation Concern on Drummond, Cockburn, and Manitoulin Islands

Cockburn Island, along with the neighboring Manitoulin Island and Drummond Island, contains "an incredible variety of globally significant species and plant communities—the richest of any region within the Canadian portion of the Great Lakes Basin" (Nature Conservancy of Canada 2015). It is therefore useful

FIGURE 4. Large individual of *Solidago houghtonii* on Doc Hewson Bay. Labor Day Weekend, 2013.

to note here plants of conservation concern that are found on one or more of these three islands. There are 32 species on Cockburn Island, Drummond Island, or Manitoulin Island that have special designations assigned by either the Michigan Natural Features Inventory, the Ontario Ministry of Natural Resources, or by

the Committee on the Status of Endangered Wildlife in Canada. These are listed, along with their status and rankings in each jurisdiction, in Table 3.

Drummond Island contains the largest number, with 27 plants of high value; Manitoulin Island contains the next largest number with 20; and Cockburn Island third with 12. Even though Cockburn is a much smaller island, it has a healthy number of species of conservation concern.

INFLUENCES ON NATURAL HISTORY

Many factors have influenced the natural history of Cockburn Island, and they are woven into the natural framework—animals living on the island, fire, humans, and the arrival of invasive plants.

Animals

There are healthy populations on the island of beaver (*Castor canadensis*), black bear (*Ursus americanus*), black squirrel (*Sciurus carolinensis*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), red squirrel (*Tamiasciurus hudsonicus*), river otter (*Lontra canadensis*), ruffed grouse (*Bonasa umbellus*), snowshoe hare (*Lepus americanus*), white-tailed deer (*Odocoileus virginianus*), and wolf (*Canis lupus*).

The coyotes are large, since they appear to be hybridizing with the wolf population (Ian Anderson, former conservation officer, pers. comm.). Deer browse is often encountered, especially on the lower boughs of *Thuja occidentalis* and on shrubs, saplings, and herbaceous plants. The islanders keep the deer herd in check through their fall hunt, and predators (especially bear, bobcats, coyotes, and wolves) take their toll on young and old deer. Deer beds (where deer spend some of their inactive hours) are frequently seen. Deer, bear, and snowshoe hares tend to nip here and there on vegetation, lightly pruning the plants as they go. When acorns, apples, blackberries, plums, and raspberries are ripe, bears pull down branches in order to eat the fruit; they also graze fruit that has dropped to the ground. In the late summer of 2015, a coyote was seen eating domestic plums from a small tree in the village (David Hale, pers. comm.). The seeds from these grazed fruits are easily dispersed via animal scat. *Taxus canadensis* (Groundhemlock; Yew) is found only in areas that are protected from deer grazing, such as on boulders that have dislodged from the limestone cliffs south of the 12th Concession Road, east of the 15th Sideroad.

Fire

Fire has had a strong impact on the flora. The eastern side of the island all the way down to the southern shore burned about 70 years ago, and the deforestation of the Tea Kettle limestone bedrock glade is one result of this burn (Mayor David Haight, pers. comm.). People living on the island are very aware of fire possibilities and ban any fires when conditions warrant. In the event of a fire, there is a pumper truck and fire packs for the islanders to use until the Canadian Forest Service firefighters can fly to the island via forest service helicopter.

TABLE 3. Species of conservation concern on Drummond, Cockburn, and Manitoulin Islands. Presence on each island is indicated by an "X." Michigan state status categories are indicated as follows: E = endangered; T = threatened; SC = special concern. Ontario provincial status categories and Canadian national ranks are indicated as follows: END = endangered; THR = threatened; SC = special status. State and provincial ranks are indicated as follows: S1 = critically imperiled; S2 = imperiled; S3 = vulnerable; S4 = apparently secure. Two ranks shown together (e.g., S2S3) indicate uncertainty and a range between the two ranks; similarly, a "?" indicates uncertainty as to exact ranking. The indication "LT" for US national rank indicates a listed threatened ranking. Presence of a species on Drummond Island follows MICHIGAN FLORA ONLINE (2013), and presence on Manitoulin Island follows Morton and Venn (2000). Michigan and US national status and ranks are described in, and taken from, Michigan Natural Features Inventory (2014); Ontario and Canadian national status and ranks are described in, and taken from, Oldham and Brinker (2009).

	Presence			State or Provincial Status		State or Provincial Rank		National Rank	
Name	Drummond Island	Cockburn Island	Manitoulin Island	Michigan	Ontario	Michigan	Ontario	US	Canada
Adlumia fungosa	X	X	X	SC		S3			
Agalinis gattingeri			X	E	END	S1	S2		END
Asplenium rhizophyllum			X	T		S2S3			
Asplenium ruta-muraria	X		E			S1	S2		
Asplenium viride	X	X	X	SC		S3			
Astragalus neglectus	X		X		SC S3 S3				
Botrychium lanceolatum	X	X	X				S3?		
Calypso bulbosa	X	X	X	T		S2			
Carex richardsonii	X	X	X	SC		S3S4			
Carex scirpoidea	X	X	X	T		S2	S3		
Cerastium brachypodum	X			T		S2	S2		
Cirsium hillii	X	X	X	SC	THR	S3	S3		THR
Cirsium pitcheri		X	X	T	END	S3	S2	LT	END
Cypripedium arietinum	X	X	X	SC		S3	S3		
Cystopteris laurentiana	X	X	X	SC		S1S2	S3		
Drosera anglica	X	X	X	SC		S3			

(Continued on next page)

TABLE 3. (Continued).

Name	Presence			State or Provincial Status		State or Provincial Rank		National Rank	
	Drummond Island	Cockburn Island	Manitoulin Island	Michigan	Ontario	Michigan	Ontario	US	Canada
Eleocharis compressa	X		X	T		S2			
Geum triflorum	X		X	T		S2S3			
Gratiola aurea	X		X	T		S1S2			
Gymnocarpium robertianum	X	X	X	T		S2	S2		
Iris lacustris	X		X	T	THR	S3	S3	LT	THR
Packera obovata		X	X				S3		
Panicum philadelphicum	X		X	T		S2			
Pellea atropurpurea	X		X	T		S2	S3		
Platanthera unalascensis	X	X	X	SC		S2S3			
Poa alpina	X		X	T		S1S2			
Pterospora andromedea	X	X	X	T		S2	S2		
Scutellaria parvula	X		X	T		S2			
Solidago houghtonii	X	X	X	T	THR	S3	S2	LT	SC
Sporobolus heterolepis	X		X	SC		S3	S3		
Tanacetum bipinnatum	X	X	X	T		S3	S4		
Tetraneuris herbacea			X	E	THR	S1	S3	LT	THR

Human Influence

The central portion of the island around the tall kame of McCaig's Hill was historically farmed, as were some of the northern parts of the island. Conifer plantations survive, many acres of sandy soil having been planted for reforestation with *Larix decidua* (European Larch), *Picea abies* (Norway Spruce), *P. glauca* (White Spruce), *Pinus resinosa* (Red Pine), or *P. sylvestris* (Scots Pine). Many of these plantations were planted in the late 1940s and the early1950s, according to Ontario Paper Company's Forest Type Map.

Some of the 100-acre tracts and small- and medium-sized town lots are now in private hands. Many former residents held on to their property, and they (and their offspring) continue to come to the island from the time the ice is out in April to mid-November. There are fifty camps in and near the town of Tolsmaville, and other camps are scattered throughout the bush. About 100–175 people come to the island during hunting season, depending on the size of the deer herd and the severity of the weather. In times of safe ice in the winter, a tree line is put in from Thessalon to the island, a distance of 24 miles across the North Channel. Poles or small trees are set frequently enough to enable people to see the way in poor weather conditions. Once the ice is safe, a small influx of people from the mainland who have camps on the island travel to the island for a few days of snowmobiling and socializing. In winters when the ice is especially thick, people drive cars and trucks over to the island. The church and township hall are active during the summer months, and the two old school houses are still standing. Cockburn Island has no public transportation, few safe landing sites by water, and only a skeletal network of roads and trails. There are only a few places to rent, no campgrounds, no store, no gas for sale, and no car rental.

The islanders harvest a number of wild items, including:

- Christmas trees and boughs—*Abies balsamea* (Balsam Fir), *Picea glauca* (White Spruce), and *Pinus strobus* (White Pine) for wreath boughs and *Vitis riparia* (River-bank Grape) for the frames.
- Firewood—predominantly *Acer saccharum* (Sugar Maple) and *Fagus grandifolia* (American Beech), and *Thuja occidentalis* for kindling. All camps have wood stoves, so there is always a woodpile connected with each dwelling.
- Fish—*Esox lucius* (Northern Pike) and *Perca flavescens* (Yellow Perch) are found in Sand Lake; *P. flavescens* and *Micropterus dolomieu* (Smallmouth Bass) are found in the north shore coves; and *Coregonus clupeaformis* (Lake Whitefish), *Oncorhynchus gorbuscha* (Pink Salmon), *Oncorhynchus kisutch* (Coho Salmon), and *Salvelinus namaycush namaycush* (Lake Trout) are found in the North Channel and the Mississagi Strait (Andrea and Lee Chappell and Mayor David Haight, personal communication, May 18, 2013).
- Floral arrangements used for church, table, and wedding decorations—*Achillea millefolium* (Yarrow), *Asparagus officinalis* (Garden Asparagus), *Centaurea nigra* (Black Knapweed), *Coreopsis lanceolata* (Sand Coreopsis), *Daucus carota* (Wild Carrot), *Dryopteris carthusiana* (Spinulose

Woodfern), *D. intermedia* (Evergreen Woodfern), *Galium trifidum* (Small Bedstraw), *Lilium philadelphicum* (Wood Lily), *Solidago* spp. (Goldenrods), and *Tanacetum vulgare* (Common Tansy).

- Fruit to eat—*Crataegus succulenta* var. *macracantha* (Hawthorn), *Malus pumila* (Apple), *Prunus americana* (American Plum), *Rubus parviflorus* (Thimbleberry), *R. strigosus* (Wild Red Raspberry), *Vaccinium angustifolium* (Low Sweet Blueberry), and *V. macrocarpon* (Large Cranberry).
- Greens to eat—*Allium tricoccum* (Wild Leek), *Matteuccia struthiopteris* (Ostrich Fern), and *Nasturtium macrophyllum* (Watercress).
- Gravel for driveways and roads.
- Mushrooms to eat—*Armellariella mellea* (Honey Mushroom), *Calvatia gigantea* (Puffball) *Canatherellus cibarius* (Chanterelle), *Coprinus comatus* (Shaggy Mane), *Hericium ramosum* (Comb Tooth), *Marasmius oreades* (Fairy Ring Mushroom), *Morchella angusticeps* (Black morel), *Pleurotus ostreatus* (Oyster Mushroom), *Laetiporus sulphureus* (Chicken Mushroom), and *Urnula craterium* (Devil's Urn, Trumpet of Death)—scientific names from Lincoff (1981).
- Timber for building: many of the camps contain *Picea glauca* and *Thuja occidentalis* walls made from logs that were sawn into dimensional lumber on the island in a small mill operated by an old car engine. Building projects that must withstand years of water, such as docks, are generally built with *Tsuga canadensis* (Hemlock).
- Wildlife to eat—Ruffed grouse and White-tailed deer.

Invasive plants

A suite of agriculture-related weeds have been on the island since the time of farming: *Bromus inermis* (Smooth Brome), *Centaurea nigra*, *Dactylis glomerata* (Orchard Grass), *Daucus carota*, *Hypericum perforatum* (Common St. John's-wort), *Leucanthemum vulgare* (Ox-eye Daisy), *Phleum pratense* (Timothy), *Poa compressa* (Canada Bluegrass), and *P. pratensis* (Kentucky Bluegrass). Horse and oxen hooves, vehicle tires, people, and wind have spread these non-native plants widely over the years. *Robinia pseudoacacia* (Black Locust) has been planted along a few roadsides, but it has not spread much.

Alliaria petiolata (Garlic Mustard) made its first appearances in 2010 near Dwarf Village on the Cross-over Road and along the Huron Timber Dock Road, and the first fruiting collection was made in 2012. It is now found at other sites along transportation routes. The management of Huron Timber Co. has now implemented methods for cleaning its equipment before bringing machinery to the island by barge in order to rid them of invasive plant material. *Cirsium palustre* (European Marsh Thistle) is in the Northern Wet Meadow at Robinson Bay and nearby along the North Channel beach and along several roads in ditches. Rosettes were first found in 2011, and a flowering specimen was collected in 2012. Since then, the author has destroyed hundreds of rosettes and flowering

stalks. *Dipsacus fullonum* (Wild Teasel) was first found in and along a logging road through a *Populus/Thuja* woods in 2009. *Fallopia sachalinensis* (Japanese Knotweed) has been on the island for many years and is spreading throughout several acres of a former homestead on the 12th Concession Road. The invasive *Gypsophila scorzonerifolia* (Baby's Breath) was already present on the island when the study began in 1997 and is common along Sand Bay and Doc Hewson Bay, where it is mixed in with the native *Solidago houghtonii*. A small area of *Lythrum salicaria* (Purple Loosestrife) was found by islander Arlene McQuarrie on August 30, 2012 along the 10th Sideroad north of the 7th and 8th Concession. The author eradicated this site. *Mycelis muralis* (Wall Lettuce) seedlings showed up in 2011 on the Cross-over Road. Fruiting plants were found in 2012 on the 15th Sideroad, just south of Rickett's Harbor Trail, in Grace's Hardwoods, a selectively cut *Acer saccharum* woods, and in September 2, 2015, several small plants showed up in the author's yard in the village. As many of the plants as possible were destroyed by the author at all of these sites. The first sites of *Phragmites australis* subsp. *australis* were found in 2013 on the newly opened 9th Concession Road and on the sand beach of Doc Hewson Bay. *Taraxacum palustre* (Marsh Dandelion) was found by visitors Frederick W. Schueler and Aleta Karstad, who attended an NCC experts' weekend on June 2, 2014. There were 73 flowering plants found later on the site by the author in grass along the road to the Government Dock, in a mixed population with *T. officinale* (Common Dandelion). A colony of *Tussilago farfara* (Coltsfoot) was found by the author growing in a deep ditch on the south side of the12th Concession, 0.35 mile west of "W" Street. There were about a hundred plants growing in sandy gravel along side running water of the ditch. This invasive was first collected on May 26, 2014 and was mostly eradicated on June 1, 2014 by NCC personnel. Other nonnatives were found in the spring of 2014, but as yet have not spread to other sites: *Humulus lupulus* (Common Hops) and *Vinca minor* (Periwinkle) are thriving in the yard of an old log farm cabin on the 12th Concession, east of the 20th Sideroad. *Tanacetum balsamita* (Costmary) and *Luzula pallidula* were found along roadsides in the village by Sam Brinker, MNR (NHIC). The Cockburn Island populationa of *Luzula pallidula* are disjunct from the range of this species shown in the *Flora of North America* (Swab 2000), which indicates that the major range is in the far northeastern states and eastern Canadian provinces.

NATURAL PLANT COMMUNITIES

The following account describes the natural and artificial plant communities found on Cockburn Island. The classification of the natural plant communities and the descriptions of each are taken from Cohen et al. (2014). Brief descriptions of the various plant community types are reproduced with permission. Many of the wetland habitats are in high-quality condition, since these areas often contain small, gnarled trees and were therefore not suitable for timber. Upland areas have been farmed in the past, and some of them are currently being timbered. No farming currently exists on the island. None of these habitats has

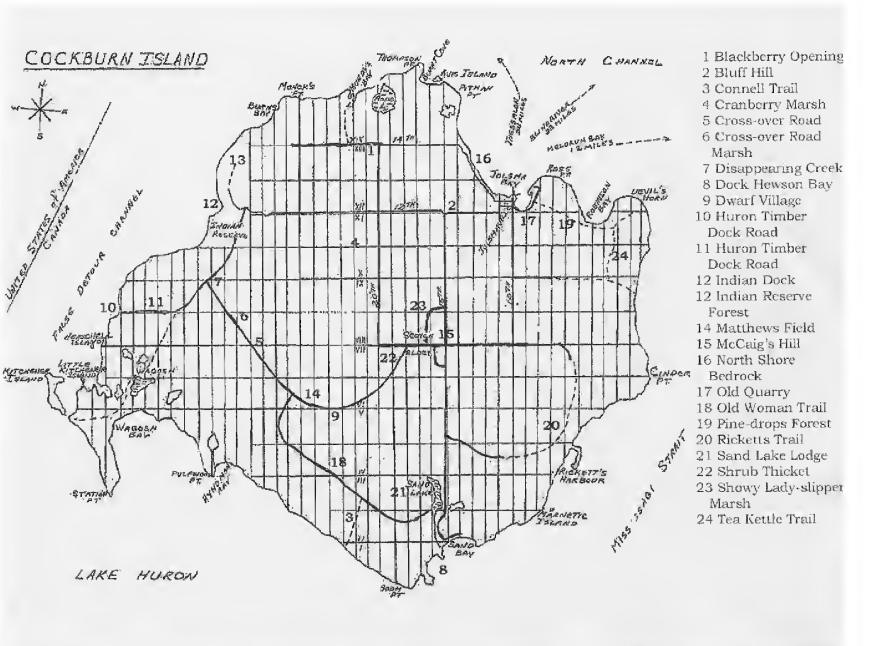

FIGURE 5. Position of main roads and current collection sites on Cockburn Island. Map (slightly modified) is taken from *Yonder Our Island* (MacDonald, 1979) and reprinted with permission of the Cockburn Island Council.

been managed for strictly conservation purposes, although management of land now owned by the NCC is in the planning stage. Work parties of both staff and island volunteers have already taken place, and summer students hired by the Cockburn Island Council have also accomplished considerable eradication of invasive species.

Some of the notable sites for each of the natural community types on Cockburn Island are described below, and their locations are shown in Figure 5.

PALUSTRINE CLASS—MARSH COMMUNITIES

Submergent Marsh

> Submergent marsh is an herbaceous plant community that occurs in deep to sometimes shallow water in lakes and streams . . . . Vegetation is comprised of both rooted and non-rooted plants that occur completely beneath the water surface (i.e., submergent plants), rooted floating-leaved plants, and non-rooted floating plants.

This community is found occasionally, especially in the southwest portion of the island and in some of the larger beaver floodings.

Black Creek at Cross-over Road. A series of small ponds and marshes are connected by the slight flow of Black Creek, resulting in an extensive marsh. The creek eventually disappears underground in limestone fractures and reappears near the Huron Timber Dock Road. Marsh plants include *Nuphar variegata* (Yellow Water-lily), *Persicaria amphibia* (Water Smartweed), *Potamogeton richardsonii* (Richardson's Pondweed), and *Utricularia intermedia* (Flat-leaved Bladderwort). Several characteristic plants of this habitat type, such as *Lemna minor* (Common Duckweed), *L. trisulca* (Star Duckweed), and *Spirodela polyrhiza* (Greater Duckweed), are apparently absent from Cockburn Island and Drummond Island (Voss and Reznicek, 2012) but are found on Manitoulin Island (Morton and Venn 2000).

Emergent Marsh

> Emergent marsh is a shallow-water wetland that occurs along the shores of lakes and streams . . . . Vegetation is comprised of narrow- and broad-leaved graminoids (i.e., grass-like plants) and herbs that extend above the water surface (i.e., emergent plants), as well as floating-leaved plants.

This is a common community, especially in the southwest portion of the island and in some of the larger beaver floodings.

Sand Creek at Cross-over Road. Nasturtium macrophyllum and *Sparganium* sp. grow in the small marshes formed at the sides of the creek where it crosses the Cross-over Road and also where the creek crosses the 7th and 8th Concession Road. .

Northern Wet Meadow

> Northern wet meadow is a groundwater-influenced, sedge- and grass-dominated wetland . . . . [It] typically borders streams but is also found on pond and lake margins and above beaver dams.

This is an uncommon community on the island.

Black Creek at Cross-over Road. There is Northern Wet Meadow vegetation to either side of the deeper water of the Submergent Marsh. The white spires of *Spiraea alba* (Meadowsweet) are conspicuous in mid-July and are mixed with *Calamagrostis canadensis* (Blue-joint), *Carex lasiocarpa* (Slender Sedge), and *Persicaria amphibia*. Common ferns are *Onoclea sensibilis* (Sensitive Fern) and *Osmunda regalis* (Royal Fern). Shrubs are dominant around the edges and include *Alnus incana* (Tag Alder), *Cornus sericea* (Red-osier), *Myrica gale*, *Salix bebbiana* (Bebb's Willow), and *S. discolor* (Pussy Willow). Saplings of *Larix laricina* and *Thuja occidentalis* are encroaching from the edges of the marsh.

Robinson Bay. The northern wet meadow vegetation is several hundred feet inland from Robinson Bay and is divided from northern fen vegetation at this locality by a creek that empties directly into the North Channel through an opening in the beach ridge. This area has a high water table throughout the year. Common graminoids include *Calamagrostis canadensis*, *Carex aquatilis* (Aquatic Sedge), *C. lasiocarpa*, *C. stricta* (Tussock Sedge), *Cladium mariscoides* (Twig-rush), and *Scirpus atrovirens* (Dark-green Bulrush). Herbaceous species that are

tucked in among the stems of the dominant graminoids include *Asclepias incarnata* (Swamp Milkweed), *Campanula aparinoides* (Marsh Bellflower), *Cicuta bulbifera* (Water Hemlock), *Cirsium palustre*, *Comarum palustre*, *Eupatorium perfoliatum*, *Euthamia graminifolia* (Grass-leaved Goldenrod), *Eutrochium maculatum*, *Lycopus americanus* (Common Water-horehound), *L. uniflorus*, *Symphyotrichum lanceolatum* (Panicled Aster), and *S. puniceum*. *Alnus incana* and *Larix laricina* are moving in from the edges, but the area is quite wet, so they haven't invaded extensively.

7th and 8th Concession Road. The northern wet meadow vegetation is located on both sides of the middle branch of Sand Creek where it crosses the 7th and 8th Concession Road just east of the 20th Sideroad. The area is a former beaver swamp, with a dilapidated dam no longer holding back the narrow creek that now wanders through the area. Pteridophytes include *Equisetum arvense* (Common Horsetail) *Onoclea sensibilis*, *Osmunda cinnamomea* (Cinnamon Fern), *O. regalis*, and *Thelypteris palustris* (Marsh Fern). Herbaceous plants are plentiful and include *Caltha palustris* (Marsh-marigold), *Eupatorium perfoliatum, Eutrochium maculatum* (Joe-pye-weed), *Impatiens capensis* (Spotted Touch-me-not), *Iris versicolor* (Wild Blue Flag), *Lycopus uniflorus* (Northern Bugle Weed), *Solidago canadensis* (Canada Goldenrod), *S. gigantea* (Late Goldenrod), *S. rugosa* (Rough-leaved Goldenrod), and *Symphyotrichum puniceum* (Swamp Aster). This area is surrounded by northern wet meadow vegetation.

Interdunal Wetland

> Interdunal wetland is a rush-, sedge-, and shrub-dominated wetland situated in depressions within open dunes or between beach ridges along the shorelines of the Great Lakes. . . . Water levels fluctuate both seasonally and from year to year in synchrony with changes in Great Lakes water levels and strongly influence species composition and community structure.

This habitat is found on southern beaches.

Sand Bay. There is interdunal wetlands vegetation in several places between low beach ridges where long troughs of *Utricularia cornuta* (Horned Bladderwort) are mixed with *Cladium mariscoides*. In times of low water and little rain, these areas dry up, only to be revived again with an accumulation of water.

Sand Creek Abandoned Channels. Interdunal wetland vegetation is found along the beach of Lake Huron adjacent to the present Sand Creek, where Sand Creek has changed direction, depending on accumulation of sand and various obstructions (such as brush and downed trees) (Figure 6). These former creek beds are colonized by *Calamagrostis canadensis*, *Carex viridula* (Green Sedge), *Cladium mariscoides*, *Juncus balticus* (Straight-line Sedge), and *Schoenoplectus pungens* (Common Threesquare). Herbaceous plants are *Euthamia graminifolia*, *Parnassia parviflora*, *Primula mistassinica*, *Triantha glutinosa* (Sticky False Asphodel), and *Triglochin maritima* (Common Bog Arrow-grass). The few shrubby plants are *Cornus sericea* and *Dasiphora fruticosa* (Shrubby Cinquefoil). Water levels vary between standing water, damp sand, and marl flats. It is possible to cross the creek where it flows into Lake Huron, but the slurry of wet sand is often treacherous to navigate.

FIGURE 7. Stream leaving northern fen and flowing into Robinson Bay of the North Channel. April 6, 2012.

PALUSTRINE CLASS—FEN COMMUNITIES

Northern Fen

> Northern fen is a groundwater-influenced wetland community dominated by graminoids, forbs, shrubs, and stunted conifers. . . . [It] is often associated with . . . cold, calcareous, groundwater-fed springs.

This is an uncommon community on Cockburn Island.

Robinson Bay. The northern fen vegetation is several hundred feet south of Robinson Bay (Figure 7) and is fed by springs that bubble under the limestone layers to the south. In times of snow melt and heavy rain, the area floods for a short time. Early in the season, the fresh blooms of *Primula mistassinica* appear; in June comes *Liparis loeselii* (Loesel's Twayblade) and the tall spires of *Platanthera dilatata* (Tall White Bog Orchid), followed by *Platanthera psycodes* (Purple-fringed Orchid) in mid-July. In late summer, *Parnassia glauca* covers the fen. Other plants present throughout much of the growing season are *Calamagrostis canadensis*, *Campanula rotundifolia* (Bellflower), *Carex buxbaumii* (Buxbaum's Sedge), *Drosera rotundifolia*, *Potentilla anserina*, *Sarracenia purpurea* (Pitcher-plant), *Solidago ohioensis* (Ohio Goldenrod), and *Trientalis borealis*. Shrubby plants include *Dasiphora fruticosa*, *Hypericum kalmianum*, *Myrica gale*, *Physocarpus opulifolius* (Ninebark), and *Rhamnus alnifolia*. *Larix laricina* and *Thuja occidentalis* are scattered in clumps. *Cirsium palustre* was first noticed in 2011, and by 2013 there were numerous flowering stalks and rosettes. Bears and otters frequent the area and leave flattened vegetation and empty crayfish shells; deer beds are common.

Coastal Fen

> Coastal fen is a sedge-, rush-, shrub-dominated wetland that occurs on calcareous substrates . . . where marl and organic soils accumulate in protected coves and abandoned coastal embayments . . . . Vegetation is comprised primarily of calciphilic species capable of growing on wet alkaline substrates.

This community is found in small areas along the southern beaches.

Robinson Bay. The coastal fen vegetation at this locality has shallow water that is covered with *Utricularia cornuta*. Pockets of marl are common. Other characteristic plants are *Carex flava* (Yellow Sedge), *C. garberi*, *Castilleja coccinea* (Indian Paintbrush), *Cladium mariscoides*, *Packera pauperculus* (Balsam Ragwort), *Parnassia glauca*, *Primula mistassinica*, *Solidago ohioensis*, *Triantha glutinosa*, and *Triglochin maritima*. The scattered shrubby plants are *Hypericum kalmii* (Kalm's St. John's-wort), *Myrica gale*, *Rhamnus alnifolia*, and stunted *Thuja occidentalis*. This fen is currently cut off from the North Channel by a low beach ridge.

Sand Bay, Eastern Side. This coastal fen is saturated by groundwater from the numerous wet seeps in the area. In mid-summer, there is the tiny *Parnassia parviflora*, and by the end of summer, the fen is covered with the more common *P. glauca* (Grass-of-Parnassus). Marl flats are ringed with *Drosera linearis* and *D. rotundifolia*, both of which also grow with a small number of *D. anglica* plants on a narrow, slightly raised mound of moist sand. Large clumps of *Sarracenia purpurea* are common. Nearby is a wet sand carpet of *Spiranthes romanzoffiana* (Hooded Ladies'-tresses).

Poor Fen

> Poor fen is a wetland dominated by sedges, shrubs, and stunted conifers, and moderately influenced by groundwater. . . . [It] typically develops on slightly acidic to strongly acidic peat.

There is one good example of this community on the island.

Cranberry Marsh. The poor fen community here lies in Lot 22 of the 10th Concession, west of the 20th Sideroad and east of the Harper's Trail. The marsh covers roughly 20 acres, about four acres of which have abundant plants of *Vaccinium macrocarpon* (Large Cranberry) mixed with *Dulichium arundinaceum* (Three-way Sedge), *Glyceria canadensis* (Northern Manna Grass), *Phragmites australis* (Reed), *Scirpus cyperinus* (Wool-grass), and *Trichophorum cespitosum* (Deer-grass), with a few plants of *Comarum palustre* (Marsh Cinquefoil) and *Typha latifolia* (Common Cat-tail). Common shrubs are *Ilex verticillata* (Michigan Holly), *Myrica gale* (Sweet Gale), *Rhamnus alnifolia* (Alder-leaved Buckthorn), and *Salix petiolaris* (Slender Willow). *Fraxinus nigra* (Black Ash) is found along the edges.

PALUSTRINE CLASS—SHRUB WETLAND COMMUNITIES

Northern Shrub Thicket

> Northern shrub thicket is a shrub-dominated wetland . . . [that] frequently occurs along streams but can also be found adjacent to lakes and beaver floodings.

There are numerous locations for northern shrub thicket on the island, because beavers have frequently dammed the streams. This community tends to occur when beavers vacate these ponds and the dams fail.

7th and 8th Concession Road. The northern shrub thicket vegetation at this locality lies on both sides of the middle branch of Sand Creek where it crosses the 7th and 8th Concession Road just east of the 20th Sideroad. The area is a former beaver swamp with a dilapidated dam that no longer holds back the narrow creek that now wanders through the area. Surrounding the northern wet meadow vegetation along the creek is a northern shrub thicket community that is dominated by dense areas of *Alnus incana* along with *Cornus sericea*, *Myrica gale*, *Rhamnus alnifolia*, *Salix bebbiana*, and *Salix discolor*. In the more stable soils around the edges, small trees have begun to colonize. These include *Abies balsamea*, *Acer rubrum* (Red Maple), *Fraxinus nigra*, *Larix laricina*, *Populus balsamifera*, and *Thuja occidentalis*.

PALUSTRINE CLASS—FORESTED WETLAND COMMUNITIES

Poor Conifer Swamp

> Poor conifer swamp is a nutrient-poor forested peatland . . . . [It] develops on extremely acidic, saturated peat in depressions . . . [and] is characterized by the prevalence of coniferous trees, ericaceous shrubs, and sphagnum mosses.

This is not a common community, because *Picea mariana* and its acid haunts are not common on the island due to the alkalinity of the underlying limestone.

Connell Trail off the Old Women Trail, also known as the Connell Dump Trail. The poor conifer swamp community lies part way along the trail between an *Acer saccharum* forest and Lake Huron. The trail drops off the escarpment by way of a creek that has eroded an opening in the steep cliff. Once the ground levels off, it is covered with an even-aged forest of *Thuja occidentalis*. Also present are *Larix laricina* (Tamarack) and *Picea mariana* (Black Spruce). Large hummocks of *Sphagnum* spp. along the trail host *Epigaea repens* (Trailing arbutus), *Gaultheria procumbens* (Wintergreen), *G. hispidula* (Creeping Snowberry), *Rhododendron groenlandicum* (Labrador-tea), *Sarracenia purpurea*, and *Vaccinium oxycoccos* (Small Cranberry). *Drosera linearis* grows on decaying logs throughout the area.

Sand Creek (at intersection of the Cross-over Road). The poor conifer swamp vegetation here is dominated by *Picea mariana* and *Larix laricina*. Also present are *Abies balsamea*, *Populus balsamifera*, and *Thuja occidentalis*. The ubiquitous *Alnus incana* is present, as are the pteridophytes *Equisetum scirpoides*

(Dwarf Scouring Rush) and *Lycopodium clavatum* (Running Ground Pine). This is one of the few places on the island where acid-loving plants are found: *Coptis trifolia* (Goldthread), *Epigaea repens*, *Gaultheria hispidula*, *G. procumbens*, *Mitella nuda* (Naked Miterwort), and *Rhododendron groenlandicum* (Labrador-Tea). A branch of Sand Creek meanders through the area and is crossed by many blow-downs, a consequence of high winds and unstable soils.

Rich Conifer Swamp

> Rich conifer swamp is a diverse groundwater-influenced, forested wetland dominated by northern white-cedar (*Thuja occidentalis*) . . . . [It] typically develops on saturated, circumneutral to moderately alkaline peats that may be acidic near the surface where sphagnum mosses are locally prevalent.

This is an uncommon habitat to find in good condition, because many of the mature *Thuja occidentalis* sites have been harvested for timber.

Cypripedium reginae Site. The rich conifer swamp at this site is where islanders used to collect armfuls of *Cypripedium reginae* (Showy Lady-slipper) for festivities and to sell to people who passed through on boat trips. The area is now being shaded in by *Larix laricina*, *Picea mariana*, and *Thuja occidentalis*. The orchids flower only in the more open areas, and the flowering stems tend to be nipped by deer. The common fern is *Thelypteris palustris*. Also present are *Coptis trifolia*, *Eutrochium maculatum*, *Gaultheria hispidula*, *Lilium philadelphicum*, and *Typha latifolia*. Common shrubs are *Vaccinium myrtilloides*, *Vaccinium oxycoccos*, and *Rhododendron groenlandicum*.

Sand Bay (east end). The rich conifer swamp vegetation here contains stunted *Thuja occidentalis* and *Abies balsamea* trees. The yellow-green *Liparis loeselii* blooms here from early May to early June, often with last year's flowering stalks still attached. They are surrounded by *Caltha palustris*, *Carex buxbaumii*, *C. sterilis* (Fen Star Sedge), *Clintonia borealis* (Bluebead-lily), *Coptis trifolia*, *Dasiphora fruticosa*, *Gaultheria hispidula*, *Linnaea borealis* (Twinflower), *Polygala paucifolia* (Gay-wings), *Potentilla anserina* (Silverweed), *Primula mistassinica*, *Sarracenia purpurea*, *Sphagnum* spp. (Peat moss), *Veronica beccabunga* var. *americana* (Brooklime), and *Trientalis borealis* (Starflower). Also flowering during June are the greenish-purple flowers of *Listera convallarioides* (Broad-leaved Twayblade) and the less common white-flowered *Platanthera obtusata* (Blunt-leaved orchid). In July come the fragrant, greenish-white flowers of *P. huronensis* (Tall Northern Bog Orchid); in August, the fruit of *Vaccinium myrtilloides* (Velvet-leaved Blueberry) is ripe.

Northern Hardwood Swamp

> Northern hardwood swamp is a seasonally inundated deciduous forested wetland typically dominated by black ash (*Fraxinus nigra*). . . . [It] occurs on circumneutral to slightly acidic mineral soils and shallow mucks . . . .

This is not a common community on the island.

McCaig's Hill. The northern hardwood swamp community here is located on the eastern slope of McCaig's Hill, the prominent kame in the middle of the is-

land. Numerous springs form a narrow, long seepage area where the slope levels off part way down the hill. *Fraxinus nigra* is dominant; other trees are *Betula papyrifera* and *Fagus grandifolia* (growing on hummocks), *Acer saccharinum*, and *Populus balsamifera* (in the wetter areas). Thriving in the wet understory are *Caltha palustris*, *Circaea alpina* (Small Enchanter's Nightshade), *Equisetum fluviatile* (Water Horsetail), *E. scirpoides*, *Ribes americanum* (Wild Black Currant), and *Matteuccia struthiopteris*.

PALUSTRINE/TERRESTRIAL CLASS

Wooded Dune and Swale Complex

Wooded dune and swale complex consists of a series of parallel wetland swales and upland beach ridges (dunes) found in coastal embayments and on large sand spits along the shorelines of the Great Lakes.

This habitat is found in several sites along the south shore where sand beaches are present, such as on Sand Bay, Doc Hewson Bay, and Wagosh Bay.

Sand Hills. This example of wooded dune and swale complex is a part of an ancient dune system left by receding waters of Glacial Lakes Algonquin and Nipissing (Morton and Venn 2000). In successive stages, sand from the open beach formed sand dunes, swales appeared between them, then the water level receded and the process repeated itself. These old dunes are found to the edge of Little Sand Lake (east of Sand Lake), over a half-mile north. For plants found in the swales near Lake Huron, see under Interdunal Wetlands. For the plants of open sand, see the Open Dunes section. The more northern swales are dominated by *Alnus incana* and *Cornus sericea*. Tucked in between the shrubs is the fern, *Thelypteris palustris* and the graminoids, *Carex aquatilis*, *C. lasiocarpa*, *C. stricta*, and *Scirpus cyperinus*. Meandering streams that pass through the southern part of the area keep these areas wet.

Ferns on the old dunes of the Sand Hills area are *Dryopteris intermedia* (Evergreen Woodfern) and *Pteridium aquilinum* var. *latiusculum* (Bracken Fern). Herbaceous plants include *Aralia nudicaulis* (Wild Sarsaparilla), *Solidago rugosa*, and *Symphyotrichum ciliolatum* (Lindley's Aster). *Arceuthobium pusillum* (Dwarf Mistletoe), grows abundantly on *Picea glauca*, especially in the vicinity of the narrow access road to the township picnic area on the beach. Shrubs are *Corylus cornuta* (Beaked Hazelnut), *Rubus parviflorus* (Thimbleberry), *Rubus strigosus*, and *Vaccinium angustifolium*. The canopy contains *Abies balsamea*, *Acer pensylvanicum* (Striped Maple), *Picea glauca*, *Pinus resinosa*, *Populus tremuloides*, and *Quercus rubra* (Red Oak). There is a large *Pinus resinosa* plantation along the Sand Hills Trail that cuts through this old dune section.

TERRESTRIAL CLASS—FOREST COMMUNITIES

Mesic Northern Forest

> Mesic northern forest is hardwood or hardwood-conifer forest . . . [that] is primarily found on loamy sand to sandy loam on coarse-textured ground and end moraines. . . . [It] is characterized by the dominance of northern hardwoods, particularly sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*).

This is a common forest type, although due to lumbering, many of the areas have been at least partially cut for timber.

Cockburn Indian Reserve #19. The mesic northern forest here has a mixed forest of *Acer saccharum* and *Quercus rubra* underlain by limestone bedrock that often protrudes above the soil. Other trees scattered through the forest are *Abies balsamea*, *Betula alleghaniensis*, *B. papyrifera*, *Ostrya virginiana* (Ironwood), *Picea glauca*, *Populus tremuloides*, and *Thuja occidentalis*. Herbaceous plants include *Allium tricoccum*, *Cardamine diphylla* (Two-leaved Toothwort), *C. concatenata* (Cut-leaved Toothwort), *Conopholis americana* (Squaw-root), *Hypopitys monotropa* (Pinesap), *Orobanche uniflora* (Broom-rape), *Thalictrum dioicum* (Early Meadow-rue), and *Trillium grandiflorum* (Common Trillium).

Dwarf Village. The mesic northern forest community at this location is a selectively logged woods around a remote hunt camp. Trees are *Acer saccharum* and *Fagus grandifolia*, with scattered shrubs of *Sambucus racemosa* (Red-berried Elder). Wildflowers are numerous: *Allium tricoccum*, *Cardamine diphylla*, *C. concatenata*, *Dicentra cucullaria* (Dutchman's-breeches), and *Trillium grandiflorum* (Common Trillium). There are many plants of the invasive *Alliaria petiolata* growing along the road that runs through the area.

Sand Lake Lodge. This example of mesic northern forest vegetation lies west of Sand Lake, north of Lot 18 of the 3rd Concession Road. It is on a narrow point of land overlooking a beaver flooding to the west and a small branch of Sand Creek to the east that contains *Matteuccia struthiopteris* along its slow-moving borders. The selectively logged *Acer saccharum* forest contains about 75 plants of *Botrychium lanceolatum* var. *angustisegmentum* (Lance-leaved Moonwort). This tiny fern has been collected only once on neighboring Manitoulin Island (Morton and Venn 2000), and this find was a first for Cockburn Island.

Boreal Forest

> Boreal forest is a conifer or conifer-hardwood forest that occupies upland sites along shores of the northern Great Lakes . . . .[It] is characterized by species dominant in the Canadian boreal forest.

This is a very common forest type, especially around the low-lying perimeter of the island.

Robinson Bay. The boreal forest here contains several localities for the rare *Calypso bulbosa* (Calypso; Fairy-slipper). A few flowers and distinctive leaves are found every year around the end of May—and occasionally they set seed. Also found in the area are the nodding blooms of *Cypripedium arietinum* (Ram's Head Lady-slipper). The damp coniferous woods are dominated by *Abies bal-*

samea and *Thuja occidentalis* with *Carex eburnea* (Bristle-leaved Sedge), *Gaultheria hispidula*, and *Linnaea borealis* in the understory. *Calypso bulbosa* prefers the damp sites, especially near old cedar stumps, and *Cypripedium arietinum* likes both the damp and the drier old beach ridges. Where the boreal forest spreads inland from the bay is the locality for the rare *Pterospora andromedea* growing in thin soil over fractured limestone. Voss and Reznicek (2012) note that "[t]he species is disjunct between the Great Lakes region and the Black Hills and mountains to the west; also scattered eastward to Quebec and New England, but becoming very rare and local. Often said to be parasitic on the roots of pine, but presumably parasitic on fungus that forms mycorrhizae with pine and perhaps other conifers." *Pterospora andromedea* was previously reported from the island in 1870 by Robert Bell and is fast disappearing from its known sites in other places (Morton and Venn 2000). The author has seen the plant in flower several times since two fruiting stalks were spotted in 2007, but it does not appear reliably every year. The surrounding forest consists of *Abies balsamea*, *Betula papyrifera*, and *Pinus strobus*, with *Cornus rugosa* (Round-leaved Dogwood), *Eurybia macrophylla* (Large-leaved Aster), *Linnaea borealis*, and *Polygala paucifolia* in the understory.

PRIMARY CLASS—DUNES COMMUNITIES

Open Dunes

Open dunes is a grass- and shrub-dominated community located on wind-deposited sand formations near the shorelines of the Great Lakes.

This habitat is found in several sites along the south shore where sand beaches are present.

Doc Hewson Bay. The open dunes habitat here supports up to 75 plants of *Cirsium pitcheri* along the low dunes behind the beach, including seedlings, rosettes, and flowering stems. An extensive area of *Solidago houghtonii* carpets the beach and dune area in early fall (see the Complex Natural Areas section, below, for more details). Other herbaceous plants found here are *Artemisia campestris*, *Potentilla anserina*, *Parnassia glauca*, and *Symphyotrichum pilosum* (Frost Aster).

Sand Bay. The open dunes east of Sand Creek and the nearby damp sand contain a sizeable colony of *Solidago houghtonii* (See the Complex Natural Areas section for more details). The locality is about 1,000 feet long and 75 feet wide. Unfortunately, there is also an abundance of the invasive *Gypsophila scorzonerifolia* mixed in with the goldenrod. *Salix cordata* grows abundantly along the upper beach, and several clones contain both male and female flowers instead of the usual individual male or female ones. *Orobanche uniflora* and *Anticlea elegans* (White Camus) are tucked into the forest edges nearby, and *Solidago ohioensis* is also present.

The open dunes west of Sand Creek contain a small colony of *Cirsium pitcheri*. Usually only a handful of plants are found on a series of low sand

ridges. Also present are *Artemisia campestris* (Wormwood) and *Calamovilfa longifolia*.

Wagosh Bay. The open dunes here, also west of Sand Creek, contain a small colony of *Cirsium pitcheri*. In addition, the NHIC expeditions to this locality in 2003 and 2014 recorded *Ammophila breviligulata*, *Anemone multifida*, *Boechera retrofracta* (Rock Cress), *Arabidopsis lyrata* (Sand Cress), *Artemisia campestris*, *Cakile edentula*, *Calamovilfa longifolia,* and *Tanacetum bipinnatum* (seen only in 2003).

PRIMARY CLASS—SAND/COBBLE SHORE COMMUNITIES

Sand and Gravel Beach

> Sand and gravel beach occurs along the shorelines of the Great Lakes, where wind, waves, and ice abrasion maintain an open beach.

Vegetation can be sparse, although when water levels are low, there is a surge in species that can thrive for at least a short time. This habitat is common on the island.

Sand Bay. Common woody plant seedlings here are *Abies balsamea*, *Larix laricina*, *Populus balsamifera*, *Populus tremuloides*, and *Thuja occidentalis*. Herbaceous plants are *Ammophila breviligulata*, *Cakile edentula*, *Calamovilfa longifolia*, *Elymus lanceolatus*, *Juncus balticus*, *Lathyrus japonicus*, and *Potentilla anserina*. Occasionally a seedling of *Cirsium pitcheri* is found on the beach but it does better further from the lake in the dune area.

Limestone Cobble Shore

> Limestone cobble shore is a typically sparsely vegetated community of scattered herbs, graminoids, shrubs, saplings, and stunted trees growing between limestone or dolomite cobbles along the shorelines of Lake Michigan and Lake Huron . . . .

This is not a common habitat on Cockburn Island.

Connell Trail. The limestone cobble shore community at the end of the Connell Trail is full of large, wave-washed stones of various origins. Further up on the beach are old piles of logs that remain from the time that logs were hauled down the Connell Trail, over the escarpment from the Old Women Trail, to be loaded onto boats. Where sand and duff have accumulated among the rocks are occasional plants of *Anticlea elegans*, *Clinopodium arkansanum*, *Campanula rotundifolia*, *Carex viridula*, *Castilleja coccinea*, *Equisetum variegatum*, *Eupatorium perfoliatum*, *Euthamia graminifolia*, *Gentianopsis virgata* (Fringed Gentian), *Juncus balticus*, *J. dudleyi*, *Lobelia kalmii*, *Parnassia glauca*, *Potentilla anserina*, *Primula mistassinica*, *Solidago ohioensis*, *Triantha glutinosa* (Sticky False Asphodel), and *Triglochin maritima*.

PRIMARY CLASS—BEDROCK GLADE COMMUNITIES

Limestone Bedrock Glade

> Limestone bedrock glade is a savanna or open woodland community dominated by herbs, graminoids, and scattered clumps of shrubs and stunted trees that typically occurs on flat expanses of calcareous bedrock (limestone or dolomite) near the shorelines of Lake Huron and Lake Michigan . . . . The calcareous bedrock is covered by a thin veneer of mildly to moderately alkaline loamy sand or sandy loam.

It is not a common habitat on Cockburn Island. Although there is much bedrock on the island, it is frequently forested.

Bluff Hill. The limestone bedrock glade at this locality is a flat limestone plateau that lies both west and east of the intersection of the 12th Concession Road and the 15th Sideroad. Deep cracks in the exposed bedrock contain tight clumps of *Asplenium trichomanes* (Maidenhair Spleenwort). Stunted trees growing in cracks where duff and moisture have accumulated are *Abies balsamea*, *Populus balsamifera*, *P. tremuloides*, and *Thuja occidentalis*. Shrubs are *Cornus sericea* and *Juniperus communis*. *Carex pedunculata* (Red-line Sedge) and *Poa compressa* are common, as are the colorful blooms of *Solidago canadensis*, *S. hispida*, and *Symphyotrichum ciliolatum*. *Scirpus atrovirens* and *Toxicodendron rydbergii* (Poison Ivy) grow where the limestone tilts a bit to the southwest, and the plants receive more moisture.

Tea Kettle Alvar. This example of limestone bedrock glade was a former forested area of *Thuja occidentalis* that was heavily burned during a large fire 70 years ago (Mayor David Haight, pers. comm.). There still remain both standing and downed burned cedar logs scattered throughout (Figure 8). Trees and shrubs are tightly packed into any crack that holds enough soil for plant growth. Common stunted tree species are *Abies balsamea*, *Acer saccharum*, *Betula papyrifera*, *Larix laricina*, *Picea glauca*, *Pinus resinosa*, *P. strobus*, *Populus tremuloides*, *Quercus rubra*, and *Thuja occidentalis*. Tiny woody-plant seedlings (*Q. rubra* and *T. occidentalis*) are frequent. Common shrubs are *Amelanchier humilis* (Low Juneberry), *A. sanguinea* (Round-leaved Serviceberry), *Arctostaphylos uva-ursi* (Bearberry), *Cornus canadensis*, *C. rugosa*, *Corylus cornuta* (Beaked Hazelnut), *Diervilla lonicera* (Bush Honeysuckle), *Juniperus communis*, *Prunus virginiana*, *Rhamnus alnifolia*, *Rosa blanda* (Wild Rose), *R. palustris*, *Rubus strigosus*, *Shepherdia canadensis* (Soapberry), *Sorbus decora* (Mountain-ash), and *Symphoricarpos albus* (Snowberry). Herbaceous species that are scattered in the thin soil are *Anaphalis margaritacea* (Pearly Everlasting), *Apocynum cannabinum* (Indian Hemp), *Arenaria serpyllifolia* (Thyme-leaved Sandwort), *Carex eburnea*, *C. scirpoidea*, *Commandra umbellata* (Bastard-toadflax), *Cypripedium parviflorum* var. *pubescens* (Yellow Lady-slipper), *Daucus carota*, *Euphrasia stricta*, *Eurybia macrophylla*, *Hypericum perforatum*, *Leucanthemum vulgare*, *Linnaea borealis*, *Maianthemum canadense* (False Lily-of-the-valley), *Melampyrum lineare* (Cow-wheat), *Packera obovata* (Round-leaved Ragwort), *Poa compressa*, *Polygala paucifolia*, *Prunella vulgaris*, *Silene vulgaris* (Bladder campion), *Maianthemum stellatum* (Starry False Solomon-seal), *Tragopogon*

FIGURE 8. Tea Kettle limestone bedrock glade, showing burned *Thuja occidentalis* log, still intact from the extensive burn that swept through the area seventy years previously. August 3, 2012.

pratensis, and *Viola nephrophylla* (Northern Bog Violet). Pteridophytes are *Asplenium trichomanes*, *Lycopodium clavatum*, and *Pteridium aquilinum.*

This locality is notable as a northwestern extension of the range of *Packera obovata*, as evidenced by the statement in Voss and Reznicek (2012) that the "northwest edge of the range of this species reaches southern Michigan." In Michigan, it is found only in the very southernmost counties. It is, however, found in abundance in this glade, with its many interconnecting rhizomes and bright yellow flowers. The obovate leaves are much smaller than those typically found in southern Michigan (Anton Reznicek, pers. comm.).

Deer and snowshoe hares have browsed the tips of some of the small shrubs, deer scat is scattered on the ground, and shed antlers are often found. Winter browse on *Thuja occidentalis* is moderate. The seeds and skin of the fruits of *Arctostaphylos uva-ursi* and *Juniperus communis* (Common Juniper) are seen in bear scat during years with a poor fruit and nut crop.

Deer and snowshoe hares have browsed the tips of some of the small shrubs, such as *Arctostaphylos uva-ursi* and *Juniperus communis* (Common Juniper) in the years with poor crops of *Malus pumila*, *Rubus strigosus*, and *Quercus rubra*.

PRIMARY CLASS—BEDROCK LAKESHORE COMMUNITIES

Limestone Bedrock Lakeshore

Limestone bedrock lakeshore is a sparsely vegetated community that occurs on broad, flat, horizontally bedded expanses of limestone or dolomite bedrock.

This is not a common habitat on Cockburn Island.

Indian Reserve. At this locality, the limestone bedrock lakeshore community is found several hundred yards south of the Indian Dock on the False Detour Passage. Hundreds of plants of both blue and white forms of *Gentianopsis virgata* are found here in late summer. Herbaceous vegetation springs up in the small cracks in the limestone bedrock. Commonly found are *Anticlea elegans*, *Carex viridula*, *Clinopodium arkansanum*, *Campanula rotundifolia*, *Carex eburnea*, *Deschampsia cespitosa* (Hair Grass), *Euthamia graminifolia*, *Juncus balticus*, *Lycopus americanus*, *Packera paupercula* (Balsam Ragwort), *Potentilla anserina*, *Primula mistassinica*, *Solidago ohioensis*, *Symphyotrichum laeve* (Smooth Aster), and *Viola nephrophylla*. Shrubs are fairly common where sand and duff have accumulated on top of bedrock away from open water and include *Arctostaphylos uva-ursi*, *Dasiphora fruticosa*, *Hypericum kalmianum*, *Juniperus communis*, and *Shepherdia canadensis*. Seedlings of *Betula papyrifera*, *Picea glauca*, *Populus balsamifera*, and *Thuja occidentalis* are found in the deeper cracks during times of low water.

North Shore Road (northwest of town). The limestone bedrock lakeshore vegetation here is on the shore of the North Channel. Its flora is similar to that of the Indian Reserve area (above) although not so profuse.

PRIMARY CLASS—LAKESHORE CLIFF/BLUFF COMMUNITIES

Limestone Lakeshore Cliff

Limestone lakeshore cliff consists of vertical or near-vertical exposures of limestone bedrock along the shorelines of Lake Michigan and Lake Huron . . . .

This lakeshore habitat is not common on the island.

Indian Reserve. The limestone lakeshore cliffs here are found inland of the limestone bedrock lakeshore area, south of the Indian Reserve dock. These cliffs are not tall, reaching only 15 feet at most. Mosses and liverworts grow on moist seepage on some portions of the rock. Also found are stunted *Thuja occidentalis*, along with the herbaceous plants *Achillea millefolium*, *Aquilegia canadensis*, *Leucanthemum vulgare, Euthamia graminifolia*, *Fragaria virginiana*, *Geranium robertianum*, and *Maianthemum canadense*.

PRIMARY CLASS—INLAND CLIFF COMMUNITIES

Limestone Cliff

Limestone cliff consists of vertical or near-vertical exposures of limestone bedrock . . . .

This inland habitat is not common on the island.

Bluff Hill Cliffs. These limestone cliffs are located both east and west of the Bluff Hill limestone bedrock glade. The cliffs are 10–20 feet high and are part of the Niagara Escarpment. *Asplenium viride* (Green Spleenwort) grows on the

cliff's rock ledge. Growing in cracks in the cliffs (and on the boulders below) are *A. trichomanes*, *Cystopteris bulbifera* (Bulblet Fern), *C. laurentiana* (Laurentian Fragile Fern), *Dryopteris intermedia*, *Polypodium virginianum* (Common Polypody), and *Taxus canadensis* (Ground-hemlock). The boulders are some of the few places on the island where *T. canadensis* is easily seen, since their height precludes deer browse. *Aralia racemosa* (Spikenard) grows on the ground below the cliffs.

SUBTERRANEAN/SINK CLASS—KARST COMMUNITIES

Sinkhole

> Sinkhole is a depression in the landscape caused by the dissolution and collapse of subsurface limestone, dolomite, or gypsum.

It is uncommon on the island.

Devil's Sink Hole. This sinkhole is located on the northeast side of the island. This depression has now been filled with water due to beaver action and is no longer easily visible (Scott Stewart, former Cockburn Island Council member, pers. comm.).

Cranberry Marsh Creek. The creek flows east from the Cranberry Marsh, crosses to the east side of the 20th Sideroad, winds north along the road, then disappears in a small sinkhole part way between the 12th and the 14th Concessions, before appearing again just south of the 14th Concession and flowing on to Robb Lake and the North Channel.

Disappearing Creek goes underground via seeps at the western end of the Cross-over Road marsh, and then reappears several miles later, just south of the Huron Timber Road. In times of heavy rain or run-off, it has scoured a deep sinkhole before going through a culvert under the road. The creek then meanders on the west side of the road before disappearing again. It finally surfaces again and flows into the False Detour Channel.

Robinson Bay Creek flows through a series of beaver ponds, then goes underground in several sinkholes and reappears in small springs that feed the northern wet meadow community at Robinson Bay, before emptying into the North Channel. A small spring with wooden sides to hold water remains at the edge of the meadow, a remnant from the time the area was occupied by loggers bringing *Tsuga canadensis* logs to the bay to be loaded on boats (Mayor David Haight, pers. comm.)

ARTIFICIAL VEGETATION COVER TYPES

Conifer Plantations

A number of conifer plantations are scattered throughout the island. The Ontario Paper Company's detailed Forest Type Map shows most planting dates

for existing plantations to be in the 1950s and 1960s. The plantations served to reforest barren ground after logging, fire, or abandoned farm fields. The species included in these plantations were *Larix decidua*, *Picea abies*, *P. glauca*, *Pinus resinosa*, and *P. sylvestris*. Shrubs typically found in the recolonized understory are *Rhamnus alnifolia* and *Rubus strigosus*. Common herbaceous plants include *Fragaria virginiana*, *Hieracium aurantiacum*, *Hypericum perforatum*, *Leucanthemum vulgare*, *Prunella vulgaris*, *Pteridium aquilinum*, *Trientalis borealis*, and *Verbascum thapsis*. *Acer saccharum* seedlings are sometimes present.

Garbage Dump

The *Township Garbage Dump* is continually disturbed with a backhoe and by crows and ravens (and an occasional bear) looking for food. Plant species that are common are *Chenopodium album* (Lamb's quarters), *Fragaria virginiana*, *Hypericum perforatum*, *Leucanthemum vulgare* (Ox-eye Daisy), *Physalis heterophylla* (Clammy Ground-cherry), *Poa compressa*, *Rhus typhina* (Staghorn Sumac), *Sambucus racemosa*, *Toxicodendron rydbergii*, and *Verbascum thapsis*.

Gravel Pits

Huron Timber Gravel Pit (*Pomfrey Pit*). This is a large pit where gravel has been taken for roads, driveways, and building sites since the island was first settled. It lies along the Winter Road below the northwestern side of McCaig's Hill. *Centaurea nigra*, *Dirca palustris* (Leatherwood), *Hypericum perforatum*, *Physalis heterophylla*, and *Poa compressa* grow around the rim and the older portions of the pit.

Limestone Quarry

Otter Bay Limestone Quarry. This is an area of 27-foot cliffs (Figure 9) that remain from the time that limestone was quarried here and shunted out to Otter Bay by narrow-gauge railway. "[It] was worked for a short period . . . to obtain rock for use in a sulphite-pulp mill" (Wolf, 1986). Limestone rubble lies around the damp floor of the quarry, which is traversed by a small stream. Trees have grown in after the quarry operation ceased many years ago, including *Abies balsamea*, *Fraxinus pennsylvanica* (Red Ash), *Populus balsamifera*, and *Tilia americana* (Basswood). Shrubs growing at the base of the quarry are *Alnus incana*, *Cornus canadensis* (Bunchberry), *Cornus sericea*, *Corylus cornuta* (Beaked Hazelnut), *Rubus pubescens*, and *R. strigosus*. Herbaceous plants are *Actaea rubra* (Red Baneberry), *Aralia nudicaulis*, *Arisaema triphyllum* (Jack-in-the-pulpit), *Caltha palustris*, *Cystopteris bulbifera*, *Goodyera repens* (Creeping Rattlesnake Plantain), *Impatiens capensis*, *Matteuccia struthiopteris*, *Pteridium aquilinum*, *Pyrola asarifolia* (Pink Pyrola), and *Verbascum thapsus* (Mullein).

FIGURE 9. Limestone quarry cliffs, with boreal forest on top and a stream below. June 22, 2012.

Logged Woods

Recently logged woods typically result in extensive *Populus tremuloides* or *P. balsamifera* colonies that sprout quickly due to their clonal habits. The Huron Timber Company has been cutting both hardwoods and *Thuja occidentalis* as the market demands. Current logging methods use a tree processor that cuts the tree, strips off the branches, cuts the trunk into manageable lengths, then loads them onto waiting trucks to be taken to the Huron Timber Dock on the False Detour Passage. The use of the processor impacts the logging area heavily, leaving piles of slash and rutted terrain. Most of the staging areas along the main roads have been cleaned up and leveled.

Old Farm Fields

Air Strip Field (Figure 10) is a previously farmed area located north of the small airport. Natural succession is occurring, bringing in *Acer saccharum*, *Amelanchier sanguinia*, *Fragaria virginiana*, *Juniperus communis*, *Pinus strobus*, and *Pteridium aquilinum*.

*Indian Reserve***.** Old fields here are moist, partially open areas that have *Hierochloë hirta* (Sweet Grass) growing profusely in them, along with *Poa compressa* and *Solidago canadensis*.

FIGURE 10. Old field (north of the small air strip) being recolonized by *Acer saccharum*, *Amelanchier interior, Fragaria virginiana, Juniperus communis, Pinus strobus*, and *Pteridium aquilinum*. April 25, 2010.

Matthews Field. This is formerly a farm field that has been used as a gravel pit for many years. It has an intact area at its northwestern edge at the periphery of an *Acer saccharum*/*Quercus rubra* forest. Here grow seedlings of *A. saccharum* and *Q. rubra*, along with *Asclepias syriaca* (Common Milkweed), *Leucanthemum vulgare*, *Poa compressa*, and *Prunus virginiana*. Also found were several species not found elsewhere on the island: *Drymocallis arguta* (Tall or Prairie Cinquefoil), *Calystegia spithamaea* (Low Bindweed), and a few plants of *Cryptotaenia canadensis* (Honewort).

McCaig's Hill. This is a steep hill that lies mid-island and is the most prominent geological feature of the island, being visible from boats coming in from all points. It is a glacial kame formed 11,000 years ago, a remnant of the mile-high glacier that covered the island. Debris in the form of gravel, sand, and boulders mixed with the melting ice to pour through a hole in the glacier. Former farm fields and apple orchards are found on the kame and are now recolonizing with trees and shrubs. The area was too steep for wagons and horses of the early settlers, especially in the winter, so the farmers developed a network of smaller, less-steep roads at a lower elevation to by-pass this high point. Some of the Winter Road is still in existence, such as the two-track roads through the nearby Huron Timber gravel pit and the Goodmurphy Girls' Field. In this field, the au-

thor found *Helianthus pauciflorus* (Prairie Sunflower), flowering along with hundreds of plants of *Rudbeckia hirta* (Black-eyed Susan). This site of *H. pauciflorus* is considerably northeast of any Michigan collections, and it is not found on Manitoulin Island. A *Fagus grandifolia/Acer saccharum* woods covers the steep portions of the hill, but the lower areas that were extensively farmed are now reverting to second-growth woods. The old fields are filled with goldenrods and asters in the late summer and early fall, the most common being *Solidago altissima* (Tall Goldenrod), *S. canadensis*, *S. hispida* (Hairy Goldenrod), *S. nemoralis* (Old-field Goldenrod), *Symphyotrichum ciliolatum*, *S. laeve*, *S. lanceolatum*, and *S. lateriflorum* (Calico Aster). The non-native *Poa compressa* is common here, as are numerous low shrubs of *Prunus virginiana* (Choke-cherry).

Orchards

Apple (*Malus pumila*) orchards and individual apple trees are scattered throughout the drier portions of the island. They were frequently planted at the old home sites and are also spread by people and animals eating the fruit and tossing away the seeds. The trees are often misshapen, as bears frequently break the branches when they climb the trees for the fruit. In 2013, one of the islanders pruned a great many of the old trees.

Roadsides

Interesting plant sites are found growing between the roads and the adjacent forest, seemingly thriving in the sunny niche. Many of the newer invasives are found along roadsides (see the Invasive plants, above).

D Street Corner has one of the few sites for *Petasites frigidus* (Sweet Coltsfoot), as well as a colony of *Hierochloë hirta*.

Huron Timber Dock Road. Adlumia fungosa (Climbing Fumitory) was found along the road that leads to a small commercial dock for the transport of timber off the island. Thousands of pink-flowered *Adlumia fungosa* vines were present for several miles along the road in the early 2000s. They were draped over small trees (and each other) in a matted, twisted mass as much as eight feet in height. The outburst of seeds was triggered by the newly opened logging road through a mixed forest of *Acer saccharum* and *Abies balsamea* growing in disturbed, shallow soil over limestone bedrock. The plants have not been seen since 2003.

Mini-bogs are found in some of the wet roadside ditches, such as those along the 7th and 8th Concession Road. Found in damp sand are *Epigaea repens*, *Gaultheria procumbens*, *G. hispidula*, *Vaccinium oxycoccos* (Small Cranberry), and sometimes *Rhododendron groenlandicum*.

Otter Bay on the North Channel is where the government dock is located. The beaches are covered with *Potentilla anserina* and *Cornus sericea*. There is a small locality of planted *Populus nigra* (Lombardy Poplar) that is frequently found along shores of old island settlements.

The 12th Concession Ditch, just west of "W" Street, has a colony of *Tussilago farfara* (Coltsfoot) growing in a deep ditch on the south side of the road. There

are about a hundred plants, growing in sandy gravel along side running water. This invasive was first collected on May 26, 2014.

The 14th Concession Road site, just west of the 20th Sideroad, has a large colony of *Rubus allegheniensis* (Common Blackberry). In the several years that the author has watched this site, the plants bloom profusely but do not set fruit. *Rubus allegheniensis* is not common on the island. Another site where it grows is along the road to the Indian Dock, and there it does set fruit (which is eaten by bears that tear away at the plants to reach the ripe berries).

COMPLEX NATURAL AREAS

There are several complex natural areas on the Island that consist of a variety of intact habitats that intergrade into each other in their natural patterns.

Northeast Area of the Island

In the northeast corner of the island, for example, in the Tea Kettle limestone bedrock glade, *Packera obovata* reaches its northwestern known limit growing in the cracks of limestone, among old burned logs from the intense fire that occurred seventy years ago. Three creeks wander through fast drops and slow beaver ponds, after traversing a rich conifer swamp with large *Thuja occidentalis*: one creek heads to Otter Bay, another to Robinson Bay, and a third one to the Mississagi Strait. This third creek eventually flows underground, then resurfaces and bubbles through the Robinson Bay Northern Fen, where orchids, including *Platanthera dilatata* and *P. psycodes*, can be found. A northern wet meadow community is on the east side of the creek.

In the surrounding boreal forest are a handful of plants of *Calypso bulbosa* growing near a *Thuja occidentalis* stump. Many plants of *Cypripedium arietinum* and a few isolated individuals of *Calypso bulbosa are* scattered around the forest. Inland a bit from the bay is the locality for the rare *Pterospora andromedea*, growing in thin soil over fractured limestone.

Not far to the west are the old quarry limestone cliffs that have numerous ferns. The mesic northern forest at Devil's Horn is located on the northeastern headlands on the island, east of Robinson Bay. The trail passes through an *Acer saccharum* woods where *Fagus grandifolia* and *Acer pensylvanicum* (Striped Maple) are also dominants. *Tsuga canadensis* is present in small groves. In the understory are *Acer pensylvanicum* saplings and *Actaea pachypoda* (White Baneberry), with carpets of *Dendrolycopodium dendroideum* (Tree Clubmoss), *Huperzia lucidula* (Shining Clubmoss), *Lycopodium clavatum* (Running Ground-pine), and *Spinulum annotinum* (Stiff Clubmoss).

Sand Bay/Doc Hewson Area (south shore)

Another area of rich diversity is the Sand Bay/Doc Hewson Bay complex. Sand Bay of Lake Huron is a large bay on the southern side of the island that is bisected by Sand Creek. Doc Hewson Bay lies to the west of Sand Bay and has

a small dune system, an open pond, a healthy population of *Cirsium pitcheri*, and a beaver-dammed pond (Figure 11). Along this 1.5 mile stretch of the two bays is a small point of land and a dilapidated, unused cabin. The whole area is surrounded by boreal forest. Over Labor Day weekend in 2013, the author counted 4512 plants of *S. houghtonii* (Figure 12) growing on sand in these two bays, pursuant to a request from the NCC. The plants were about equally divided between the two bays; others were several hundred meters away from open water on low dunes behind a pond, mixed in with *Juniperus horizontalis* (Figure 13). These two sites are the easternmost colonies of the "Straits strain" of *S. houghtonii* (Anton Reznicek, pers. comm.).

A rich conifer swamp at the east end of Sand Bay contains stunted *Thuja occidentalis* and *Abies balsamea*, along with *Liparis loeselii*, *Listera convallarioides*, *Platanthera obtusata*, and *P. huronensis*. In the wet sand of the open beach are three species of *Drosera*, close to a carpet of *Spiranthes romanzoffiana*. A nearby wet swale is home to *Utricularia cornuta,* and *Arceuthobium pusillum* thrives nearby on *Picea glauca*. Several small creeks dribble through the sand to form microhabitats. To the west of Sand Creek grows a small colony of *Cirsium pitcheri*. A wooded dune and swale system stretches north from the bay. Old channels of the creek lie along the east side of the current creek.

FIGURE 11. Old beaver dam and pond, with *Caltha palustris*, just north of Doc Hewson Bay. April 25, 2010.

FIGURE 12. Site of 4512 plants of *Solidago houghtonii* on Doc Hewson Bay. Labor Day weekend, 2013.

FIGURE 13. Open dune, wooded dune, swale and interdunal wetland, adjacent to Doc Hewson Bay of Lake Huron. Labor Day weekend, 2013.

CONCLUSIONS

Cockburn Island went through a period of farming and timber cutting from 1879 to 1969, and timber cutting has continued since that time. The effect that people have had on the island is noticeable: the piles of cut logs waiting to be taken to the dock where a tug will take them to a North Shore market; the cutover woods that are recolonizing in even-aged stands of *Populus tremuloides*; the piles of leftover branches and debris from the cutting process; the rutted roads through the woods; and the areas where rocks were piled when the land was originally cleared (Figure 14). Even with all of this evidence of anthropogenic disturbance, there is much that has not been disturbed, and that is what this study has documented. With the purchase of over half of the island by The Nature Conservancy of Canada, the superficial scars will heal, and the forest should recover. The islanders are gradually becoming used to being part of an environmentally oriented society rather than an extractive society. Invasive species will arrive via feet, paws, waves, wind, or wheels, but with diligent management, early detection, and a rapid response plan, those weeds can hopefully be kept in check.

There are still some inaccessible parts of the island that have not been adequately studied for vascular plants. There are only two access points by car or truck to the water surrounding the island. Some areas can be reached in summer by ORV trail, and others can be reached by snowmobile in the winter. When the

FIGURE 14. Rock pile from formerly cleared land showing recolonization taking place on Williamson property along the north shore. April 2, 2010.

snow is deep enough for snowmobiles, however, the ground vegetation is not visible. The forests are impenetrable where there are no trails, and the island has returned to its wilderness beginning, with the exception of overgrown fields well on their way to succession to forest and the timbered acres in various stages of regeneration.

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APPENDIX: ANNOTATED CHECKLIST OF THE VASCULAR FLORA OF COCKBURN ISLAND, ONTARIO, CANADA

This list includes all taxa of vascular plants on Cockburn Island recorded by Norton and Venn (2000) as well as additional collections by the author and by Samuel R. Brinker. In addition, this list includes twelve species otherwise unknown from the island on the basis of sight records made by the NHIC team in 2003 and/or 2014. Ontario plant records made by Canadian experts have at least one herbarium specimen per designated area, such as the Manitoulin area that encompasses Cockburn Island (which is also known as Petit Manitoulin or Little Manitoulin). The experts then make careful sight records of much smaller areas, nine of which are found on Cockburn Island. These records are included here as an aid to future explorations on the island, although not all of the species so included are documented by herbarium specimens from Cockburn Island. Species marked with an asterisk (*) are alien species. Collections by the author are indicated by EEW MICH, and those by Samuel R. Brinker by SRB MICH. The author's specimens have been deposited in the University of Michigan Herbarium (MICH), as have those collected by Brinker. The author was unable to examine Morton and Venn's collections. Accordingly, no collection numbers are indicated for their collections. Collections by the author were limited mostly to those species that had not yet been found on Cockburn Island or were not common, according to Morton and Venn (2000). Abundance of the plant species are noted in this list as follows; **rare** (scarce, small locality); **uncommon** (sparse); **occasional** (scattered); **common** (many localities or individuals); **locally common** (not found often but abundant where found); and **abundant** (extremely common in most of the suitable habitat). Taxonomy follows

Voss and Reznicek (2012) or, for ferns and lycopods, MICHIGAN FLORA ONLINE (2011). Due to the recent changes to many of the scientific names, the names used in Voss (1972, 1985, and 1996), if different from current usage, are also noted in parentheses. A few of the common names (such as found in the genus *Carex*) are taken from Morton and Venn (2000) and from Michigan Natural Features Inventory (2014).

PTERIDOPHYTES

ASPLENIACEAE (Spleenwort Family)

Asplenium trichomanes L.; Maidenhair Spleenwort; EEW 2343, EEW 2397 MICH; first Cockburn collection on May 1, 2010; locally abundant in crevices in limestone alvar on Bluff Hill and limestone cliffs, east of Bluff Hill.

A. viride Huds.; Green Spleenwort; SRB 3358 MICH: first Cockburn collection; rare on limestone ledge on limestone cliff, east of Bluff Hill.

ATHYRIACEAE (Lady Fern Family)

Athyrium filix-femina (L.) Roth; Lady Fern; common in damp woodlands.

Cystopteris bulbifera (L.) Bernh.; Bulblet Fern; common in moist woodlands and on the Bluff Hill Cliffs.

C. laurentiana (Weath.) Blasdell; Laurentian Fragile Fern; EEW 2355 MICH; first Cockburn collection on September 1, 2010; rare in crevices on limestone bluffs and on boulders.

Gymnocarpium dryopteris (L.) Newm.; Oak Fern; occasional in rocky deciduous woodlands.

G. robertianum (Hoffm.) Newm.; Limestone Oak Fern; rare in moist humus slopes in woodlands on limestone.

Matteuccia struthiopteris (L.) Todaro; Ostrich Fern; locally abundant in roadside ditches and low, wet areas in woodlands.

Onoclea sensibilis L.; Sensitive Fern; common in swampy areas.

DENNSTAEDTIACEAE (Bracken Family)

Pteridium aquilinum (L.) Kuhn var. *latiusculum* (Desvaux) L. Underwood; Bracken; common in woodlands and thickets

DRYOPTERIDACEAE (Wood Fern Family)

Dryopteris carthusiana (Vill.) H.P. Fuchs; Spinulose Woodfern; common in deciduous woodlands.

D. cristata (L.) A. Gray; Crested Shield Fern; occasional in moist woodlands.

D. intermedia (Muhlenb.) A. Gray; Evergreen Woodfern; common in woodlands.

D. marginalis (L.) A. Gray; Marginal Woodfern; occasional in woodlands and rocky areas.

D. x *triploidea;* Wherry; rare; listed as being found near the Williton Dump in Morton and Venn, 2000, but no current specimens found.

EQUISETACEAE (Horsetail Family)

Equisetum arvense L.; Common Horsetail; abundant on roadsides, and in old fields, and wet woods.

E. fluviatile L.; Water Horsetail; uncommon in black ash swamps, marshes and, wet roadside ditches.

E. hyemale L.; Scouring Rush; occasional on shores and in roadside ditches.

E. laevigatum A. Br.; Smooth Scouring Rush; uncommon on wet sandy areas of shores.

E. palustre L.; Marsh Horsetail; occasional in wet woods and meadows.

E. pratense Ehrh.; Meadow Horsetail; occasional in wet woods of coniferous and mixed forests.

E. scirpoides Michx. Dwarf Scouring Rush; locally abundant in wet woods.

E. sylvaticum L.; Woodland Horsetail; uncommon in wet woods.

E. variegatum Schleich.; Variegated Scouring Rush; occasional on shores.

LYCOPODIACEAE (Clubmoss Family)

Dendrolycopodium dendroideum Michx. (*Lycopodium dendroideum*); Tree Clubmoss; EEW 2016 MICH; occasional in woods and overgrown grassy areas.

Diphasiastrum complanatum (L.) Holub (*Lycopodium complanatum*); Ground-cedar; uncommon in openings in coniferous woods.

D. digitatum (Dill. ex A. Braun) Holub (*Lycopodium digitatum*); Ground-cedar; uncommon in dry woods and thickets.

D. tristachyum (Pursh) Holub; Ground-cedar; sight record by NHIC team in 2014 in the Wagosh Bay area.

Huperzia lucidula (Michx) Trevis. (*Lycopodium lucidulum*); Shining Clubmoss; occasional in mixed woods.

Lycopodium clavatum L.; Running Ground-pine; occasional in coniferous woodlands and on overgrown grassy areas.

Spinulum annotinum L. (*Lycopodium annotinum*); Stiff Clubmoss; common in mixed and coniferous woods.

OPHIOGLOSSACEAE (Adder's-tongue Family)

Botrychium lunaria (L.) Sw.; Moonwort; rare in low grass at edge of sandy coniferous woodlands.

B. lanceolatum (Gmel.) Ångstr. var. *angusti-segmentum* Pease & Moore; Lance-leaved Moonwort; Lot 18; Concession 3; EEW 2330 MICH; first Cockburn collection on August 6, 2009; rare in deep humus in mature *Acer saccharum* woods.

B. matricariifolium (Doll) A. Braun; Daisy-leaved Moonwort; sight record by NHIC team in 2003 in *Acer* woods.

B. multifidum (Gmel.) Rupr.; Leather Grape-fern; Lot 21, Concession 9; EEW 2335 MICH; first Cockburn collection on November 11, 2009. Rare in grassy area in sandy old field.

B. virginianum (L.) Sw.; Rattlesnake Fern; occasional in woodlands.

OSMUNDACEAE (Royal Fern Family)

Osmunda cinnamomea L.; Cinnamon Fern; uncommon in swampy areas.

O. claytoniana L.; Interrupted Fern; uncommon in swampy areas.

O. regalis L.; Royal Fern; occasional in swampy areas.

POLYPODIACEAE (Polypody Family)

Polypodium virginianum L.; Common Polypody; uncommon on shaded rocks and cliffs.

SELAGINELLACEAE (Spikemoss Family)

Selaginella eclipes Buck; Selaginella; occasional on rocky shores.

S. selaginoides (L.) Link; Northern Spikemoss; occasional on mossy shores and in wet meadows.

THELYPTERIDACEAE (Marsh Fern Family)

Phegopteris connectilis (L.) Slosson (*Thelypteris phegopteris*); Northern Beech-fern; occasional in moist humus in woodlands.

Thelypteris palustris Schott; Marsh Fern; common in marshes, wet areas in woodlands, and damp roadside ditches.

GYMNOSPERMS

CUPRESSACEAE (Cypress Family)

Juniperus communis L.; Common Juniper; abundant in dry rocky places, disturbed areas, and on alvars.

J. horizontalis Moench; Creeping Juniper; occasional on rocky and sandy areas, especially the upper portion of shores.

Thuja occidentalis L.; White Cedar; Arbor Vitae; abundant throughout in both very wet and dry mixed forests; even-age stands are due to logging, heavy deer browse, or forest fires.

PINACEAE (Pine Family)

Abies balsamea (L.) Mill.; Balsam Fir; abundant in coniferous woodlands and often found in areas disturbed by logging.

**Larix decidua* Mill.; European Larch; planted and thriving in southern part of the island in upland, sandy areas.

L. laricina (Du Roi) K. Koch; Tamarack, Larch; common in swamps, fens, and wet rocky areas.

**Picea abies* (L.) H. Karst; Norway Spruce; EEW 2406 MICH; first Cockburn collection; found in mature stands in reforestation areas and occasionally around home sites.

P. glauca (Moench) Voss; White Spruce; abundant in dry areas, both native and planted in reforestation areas.

P. mariana (Mill.) Britton, Sterns & Poggenb.; Black Spruce; EEW 2345, EEW 2378 MICH; first Cockburn collection on May 1, 2010; local in Sand Creek area along the Cross-over Road, along the Connell Trail through a *Thuja occidentalis* swamp.

Pinus banksiana Lamb.; Jack Pine; uncommon in sandy areas.

P. resinosa Aiton; Red Pine; native in sandy and rocky soil and also found in mature stands in reforestation areas.

P. strobus L.; White Pine; occasional in woodlands.

**P. sylvestris* L.; Scots Pine; planted in reforestation areas.

Tsuga canadensis (L.) Carriere; Hemlock; occasional in wooded areas; formerly logged extensively, especially in the Robinson Bay area. Regenerates slowly.

TAXACEAE (Yew Family)

Taxus canadensis Marshall; Ground-hemlock, Yew; rare, but locally abundant in areas that are protected from deer grazing, such as on boulders that have dislodged from the limestone cliffs south of the 12th Concession Road, east of the 15th Sideroad.

ANGIOSPERMS—MONOCOTS

ALISMATACEAE (Water-plantain Family)

Sagittaria latifolia Willd.; Wapato, Duck-potato; occasional in marshy areas.

ALLIACEAE (Onion Family) [LILIACEAE]

Allium tricoccum Aiton; Wild Leek; common in *Acer saccharum* woodlands, especially on the Indian Reserve and along the Old Women Trail.

ARACEAE (Arum Family)

Arisaema triphyllum (L.) Schott; Jack-in-the-pulpit, Indian-turnip; local in damp areas of deciduous woods.

Symplocarpus foetidus (L.) W. P. C. Barton; Skunk-cabbage; SRB EEW 3349 MICH, EEW 2407 MICH; locality found by Sam R. Brinker in a *Thuja occidentalis* swamp, growing with *Alnus incana* and probably the same locality mentioned in Morton and Venn (2000). One fertile specimen was found by the author, growing on the edge of the road. Another site was discovered by islander Arlene Coventry at the southeast corner of the intersection of the 7th and 8th Concession and the 20th Sideroad.

ASPARAGACEAE (Asparagus Family) [LILIACEAE]

**Asparagus officinalis* L.; Garden Asparagus; occasional around old home sites and occasionally escapes to nearby fields.

CONVALLARIACEAE (Lily-of-the-valley Family) [LILIACEAE]

Clintonia borealis (Aiton) Raf.; Bluebead-lily; common in *Acer saccharum* forests.

Maianthemum canadense Desf.; False Lily-of-the-valley; common in deciduous forests and on grassy areas.

M. racemosum (L.) Link (*Smilacina racemosa*); False Spikenard; occasional in deciduous forests.

M. stellatum (L.) Link (*Smilacina stellata*); Starry False Solomon-seal; common in deciduous forests, and in grassy and rocky areas.

M. trifolium (L.) Sloboda (*Smilacina trifolia*); False Mayflower; occasional in cedar swamps.

Medeola virginiana L.; Indian Cucumber-root; uncommon in deciduous forests.

Polygonatum pubescens (Willd.) Pursh; Hairy Solomon's-seal; occasional in deciduous forests.

Streptopus amplexifolius (L.) DC. Twisted-stalk; rare and growing in "cold damp cedar forest near streams" (Morton and Venn, 2000). It has not been found since.

S. lanceolatus (Aiton) Reveal (*S. roseus*); Twisted-stalk; uncommon in deciduous forests.

CYPERACEAE (Sedge Family)

Carex aquatilis Wahlenb.; Aquatic Sedge; common in wet areas and standing water.

C. arctata Boott; Drooping Wood Sedge; common in deciduous and mixed forests.

C. aurea Nutt.; Gold-fruited Sedge; common on damp banks of lakes, wet forest edges, and in openings.
C. bebbii (L. H. Bailey) Fernald; Bebb's Sedge; abundant on shores and in wet ditches.
C. buxbaumii Wahlenb.; Buxbaum's or Dark-scaled Sedge; locally abundant along marshy shores and in fens, especially in the Robinson Bay Fen.
C. capillaris L.; Hair Sedge; common along the Lake Huron shore and damp mossy areas by coniferous forest edges and openings.
C. castanea Wahlenb.; Chestnut Sedge; Beauty Sedge; occasional in wet meadows and forest openings.
C. communis L. H. Bailey; Fibrous-rooted Sedge; local in deciduous forests.
C. concinna R. Br.; Low Northern Sedge; uncommon in shallow soil on limestone at coniferous forest edges.
C. crawei Dewey; Early Fen Sedge; occasional on dolomite shores and alvars.
C. crawfordii Fernald; Crawford's Sedge; rare in openings in sandy forest; found on "a logging trail…near the old indian village" (Morton and Venn 2000). It has not been found since.
C. deweyana Schwein.; Dewey's Sedge; common in forested areas.
C. diandra Schrank; Lesser Tussock Sedge; occasional in standing water in swamps and alkaline meadows.
C. disperma Dewey; Two-seeded Sedge; occasional in wet cedar swamps.
C. eburnea Boott; Bristle-leaved Sedge; abundant in coniferous forests where it forms extensive sedge 'carpets.'
C. flava L.; Yellow Sedge; common in marshes and swamps.
C. garberi Fernald; Garber's Sedge; occasional on marshy dolomite shores.
C. gracillima Schwein.; Graceful Sedge; common along shaded, damp roadsides, and in deciduous and mixed forests.
C. granularis Willd.; Meadow Sedge; common on shores and in marshy areas.
C. gynocrates Drejer; Northern Bog Sedge; occasional in cedar swamps.
C. hystericina Willd.; Porcupine Sedge; common in wet areas.
C. interior L. H. Bailey; Inland Star Sedge; common tussock-forming sedge in fens and forested swamps.
C. intumescens Rudge; Bladder Sedge; local in swamps in deciduous forests.
C. *lasiocarpa* Ehrh.; Slender Sedge; occasional along shores and in wet meadows.
C. lenticularis Michx; sight record by NHIC team in 2003 at Wagosh Bay on cobble beach.
C. leptalea Wahlenb.; Bristle-stalked Sedge; occasional in swampy coniferous forests.
C. leptonervia (Fernald) Fernald; Few-nerved Wood Sedge; common in deciduous and mixed forests.
C. peckii Howe; Peck's Sedge; occasional in forests and open grassy areas.
C. pedunculata Willd.; Red-line Sedge; Pedunculate Sedge; common in dry forests.
C. projecta Mack.; Loose-headed Oval Sedge; local in moist forest areas.
C. pseudo-cyperus L.; Cyperus Sedge; local in swamp woodland and around beaver ponds.
C. retrorsa Schwein.; Retrorse Sedge; common in moist, usually shaded swamp border and *Alnus* thickets.
C. richardsonii R. Br., Richardson's sedge; local on rocky shores and in coniferous forests.
C. rosea Willd. (*C. convoluta*); Stellate Sedge; local in deciduous forests.
C. scirpoidea subsp. *convoluta* (Kük.) D. A. Dunlop; Scirpus-like Sedge; SRB 3340 MICH; first Cockburn collection on May 30, 2014; rare on Tea Kettle Alvar (Tea Kettle Limestone Glade); a Great Lakes endemic.
C. sterilis Willd.; Fen Star Sedge; SRB 3347 MICH; first Cockburn collection May 30, 2014; locally common in open seepage meadow in east end of Sand Bay.
C. stipata Willd.; Awn-fruited Sedge; common in swamps.
C. stricta Lam.; Tussock Sedge; common in wet areas.
C. tenera Dewey; Slender Sedge; occasional in moist forests.
C. tribuloides Wahlenb.; Blunt Broom Sedge; uncommon in swampy areas in deciduous forests.
C. umbellata Willd.; Early Oak Sedge; local in grassy areas.
C. viridula Michx.; Green Sedge; common on marshy shores.

C. vulpinoidea Michx.; Small Fox Sedge; common on shores, damp grassy areas, and ditches.
annectens (E. P. Bicknell) E. P. Bicknell was listed as being on Cockburn in Morton and Venn (2000), but the "record for Cockburn is an error, and the older keys did not adequately deal with separating the two species" (pers. comm., A.A. Reznicek, May 19, 2014).
Cladium mariscoides (Muhl.) Torr.; Twig-rush; common in wet meadows and damp sandy areas along shores.
Dulichium arundinaceum (L.) Britton; Three-way Sedge; locally abundant on shores and in marshy areas (especially in the large cranberry marsh southeast of the Harper's Trail, between the 20th Sideroad and the 10th Concession Road).
Eleocharis acicularis (L.) Roem. & Schult.; Spike-rush; local on muddy shores.
E. elliptica Kunth (*E. tenuis*); Golden-seeded Spike-rush; common on shores and marshes.
E. palustris (L.) Roem. & Schult. (*E. smallii*); Creeping Spike-rush; occasional in streams and ditches.
E. quinqueflora (Hartmann) O. Schwarz (*E. pauciflora*); Few-flowered Spike-rush; occasional on shores.
Eriophorum viridi-carinatum (Engelm.) Fernald; Green-keeled Cotton-grass; Thin-leaved Cotton-grass; EEW 2018 MICH; occasional in cedar swamps.
Rhynchospora alba (L.) Vahl; White Beak-rush; local in boggy areas.
R. capillacea Torr.; Slender Beak-rush; common on shores.
Schoenoplectus pungens (Vahl) Palla (*Scirpus americanus*); Common Threesquare; Threesquare; local in silted bays.
Scirpus atrovirens Willd.; Dark-green Bulrush; common in wet areas.
S. cyperinus (L.) Kunth; Wool-grass; common in wet areas.
Trichophorum alpinum (L.) Pers. (*Scirpus hudsonianus*). Hudson Bay Bulrush, Cotton Deergrass; uncommon in fens and conifer swamps.
T. cespitosum (L.) Hartm. (*Scirpus cespitosus);* Deer-grass; occasional in fens.

HYDROCHARITACEAE (Frog's-bit Family)
Elodea canadensis Michx.; Common Water Weed; occasional in lakes.
Najas flexilis (Willd.) Rostk. & Schmidt; Slender Naiad; occasional in shallow water.

IRIDACEAE (Iris Family)
Iris versicolor L.; Wild Blue Flag; occasional in marshy areas as in the Cross-over Road marsh.
Sisyrinchium montanum Greene; Mountain Blue-eyed-grass; occasional in marshy areas and on shores.
S. mucronatum Michx., Slender Blue-eyed-grass; uncommon on shores on the south side of the island.

JUNCACEAE (Rush Family)
Juncus alpinoarticulatus Chaix. (*J. alpinus*); Northern Green Rush*;* common on shores and in roadside ditches.
J. balticus Willd.; Straight-line Sedge; common on wet sandy shores and interdunal flats.
J. brevicaudatus (Engelm.) Buchenau; sight record by NHIC team in 2003 on shoreline of Wagosh Bay.
J. dudleyi Wiegand; Dudley's rush; common in roadside ditches and marshes.
J. effusus L.; Soft-stemmed Rush; common in roadside ditches, marshes, and on shores.
J. nodosus L.; Joint Rush; common in roadside ditches, on shores, and in wet sandy disturbed areas.
J. tenuis Willd.; Path Rush; common in damp areas along trails in the woods.
**Luzula pallidula* Kirschner; Eurasian Woodrush; Fen Woodrush; SRB 3336 MICH; first Cockburn collection on May 30, 2014; rare Eurasian native. Locally common in mown lawn in town near shoreline at Tolsma Bay.

JUNCAGINACEAE (Arrow-grass Family)
Triglochin maritima L.; Common Bog Arrow-grass; common in fens, on marly shores, and in marly swales.
T. palustre L.; Arrow-grass; sight record by NHIC team in 2003 on sandy shore of Wagosh Bay.

LILIACEAE (Lily Family)—see also Alliaceae, Convallariaceae, Melanthiaceae, and Trilliaceae

Erythronium americanum Ker Gawl.; Trout Lily; common in *Acer saccharum* forests.

Lilium philadelphicum L.; Wood Lily; occasional on sandy shores and in narrow band of coniferous forests behind sandy shores.

MELANTHIACEAE (Bunchflower Family) [LILIACEAE]

Anticlea elegans Pursh (*Zigadenus glaucus*); White Camus; local on sandy shores and tucked under conifers behind the shore.

Triantha glutinosa (Michx.) Baker (*Tofieldia glutinosa*); Sticky False Asphodel; occasional on wet shores, in fens, and in wet meadows.

NAJADACEAE—see Hydrocharitaceae

ORCHIDACEAE (Orchid Family)

Calypso bulbosa (L.) Oakes; Calypso; EEW 2251 MICH; first Cockburn collection on June 1, 2007; very rare in damp coniferous forests; found near *Thuja* stumps on old beach ridges of Robinson Bay.

Coeloglossum viride (L.) Hartm. (*Habenaria viridis*); Bracted Orchid; occasional in damp forests.

Corallorhiza maculata (Raf.) Raf.; Spotted Coral-root; occasional in mixed and coniferous forests.

C. striata Lindl.; Striped Coral-root; occasional in mixed and coniferous forests.

C. trifida Chatel.; Early Coral-root; occasional in damp mixed and coniferous forests.

Cypripedium acaule Aiton; Pink Lady-slipper; Moccasin Flower; occasional in sandy forests and in open, damp, acid forests behind Lake Huron shores.

C. arietinum W.T. Aiton; Ram's Head Lady-slipper; EEW 2252 MICH; first Cockburn collection on June 1, 2007; very rare but locally abundant in open coniferous forest around Robinson Bay.

C. parviflorum Salisb.,var. *pubescens* (Willd.) O. W. Knight (*C. calceolus* var. *pubescens*); Yellow Lady-slipper; EEW 2351 MICH; occasional in open coniferous forests, along forest edges, and in grassland.

C. reginae Walter; Showy Lady-slipper; EEW 2392 MICH; first Cockburn collection on June 22, 2012; rare in swamps due to deer browsing and overgrown habitat.

**Epipactis helleborine* (L.) Crantz; Helleborine; occasional (and spreading) in disturbed areas, gardens, grassy and outhouse areas, on roadsides and in forests, especially along trails.

Goodyera oblongifolia Raf.; Menzies' Rattlesnake Plantain; uncommon in coniferous forests.

G. repens (L.) R. Br.; Creeping Rattlesnake Plantain; uncommon in coniferous forests.

Liparis loeselii (L.) Rich.; Loesel's Twayblade; EEW 2254, EEW 2285, EEW 2379 MICH; first Cockburn collection on June 1, 2007; rare in damp *Thuja occidentalis* swamps and fens, often with the previous year's dried fruiting stalks still attached.

Malaxis monophylla (L.) Sw.; White Adder's-mouth; uncommon in damp forests and open areas.

M. unifolia Michx.; Green Adder's-mouth; one specimen collected in 1932 by Koelz on a "damp sand slope…probably Boom Point" (Morton and Venn, 2000). It was not found during the current study.

Neottia convallarioides (Sw.) Nutt. (*Listera convallariodes*); EEW 2253 MICH; Broad-leaved Twayblade; rare in damp *Thuja* swamps and along sandy stream borders.

Platanthera clavellata (Michx.) Luer; Club-spur Orchid; uncommon in damp, acid, sandy soil.

P. dilatata (Pursh) Lindl. (*Habenaria dilatata*); EEW 2255 MICH; Tall White Bog Orchid; rare in fen at Robinson Bay.

P. huronensis (Nutt.) Lindl. (*Habenaria hyperborea*); EEW 2368 MICH; Tall Northern Bog Orchid; occasional in marshes, on shores, in roadside ditches, in fens, and along damp forest trails; also found in the *Thuja occidentalis* swamp at the east end of Sand Bay.

P. obtusata (Pursh) Lindl. (*Habenaria obtusata*); Blunt-leaved Orchid; EEW 2286 MICH; uncommon in damp areas in coniferous forests and in the *Thuja occidentalis* swamp at the east end of Sand Bay.

P. orbiculata (Pursh) Lindl. (*Habenaria orbiculata*); Round-leaved Orchid; recorded from the island in 1870 by Bell but no specimen or locality information (Morton and Venn 2000). It was not found during the current study.

P. psycodes (L.) Lindl. (*Habenaria psycodes*); Purple Fringed Orchid; EEW 2030, EEW 2257 MICH; uncommon in Robinson Bay Fen; also along shores, in roadside ditches, and in wet forest openings.

P. unalascensis (Spreng.) Kurtz (*Habenaria unalascensis*); Alaska Orchid; uncommon in both coniferous and deciduous forests, and in rocky clearings.

Spiranthes romanzoffiana Cham.; Hooded Ladies'-tresses; EEW 2291 MICH; locally common on wet sand of Lake Huron shores, especially on the eastern end of Sand Bay.

POACEAE (Grass Family)

**Agrostis gigantea* Roth; Redtop; common in old fields and roadsides, shores and marshes.

A. perennans (Walter) Tuck.; Autumn Bent Grass; scattered along sheltered shores and forest paths.

A. scabra Willd.; Ticklegrass; common on rocky shores and roadsides.

**A. stolonifera* L.; Creeping Bent; common in roadside ditches and on shores.

Ammophila breviligulata Fernald; Beach Grass; local in sandy areas along Lake Huron dunes and shores.

Bromus ciliatus L.; Fringed Brome; common in open woodland, in old fields, and along forest edges.

**B. inermis* Leyss.; Smooth Brome; common on roadsides and old fields.

B. kalmii A. Gray; Prairie Brome; uncommon at alvar edges near forest areas.

Calamovilfa longifolia (Hook.) Scribn.; Sand Reed Grass; common on Sand Bay and Wagosh Bay on the dunes.

Calamagrostis canadensis (Michx.) P. Beauv.; Blue-joint; common on shores, in fens, and in northern wet meadows.

C. stricta (Timm) Koeler (Narrow Reed-grass); sporadic on dunes, fens, and shores.

Cinna latifolia (Göpp.) Griseb.; Wood Reedgrass; occasional in openings in deciduous and mixed forests.

**Dactylis glomerata* L., Orchard Grass; common in old fields and dry roadsides.

Danthonia spicata (L.) Roem. & Schult.; Poverty Grass; Oat Grass; common on roadsides, alvars, and in old fields.

Deschampsia cespitosa (L.) P. Beauv.; Hair Grass; common on shores, in wet areas, and on alvars.

Dichanthelium implicatum (Scribn.) Kerguélen (*Panicum implicatum*); Panic-Grass; occasional on marsh shores and in crevices on alvars and rocky shores.

D. linearifolium (Britton) Gould (*Panicum linearifolium*); Slender-leaved Panic-grass; uncommon in sandy areas.

Elymus canadensis L.; Canada Wild-rye; common on sandy shores.

E. hystrix L. (*Hystrix patula*); Bottlebrush Grass; common on roadsides and in forest openings.

E. lanceolatus (Scribn. & J. G. Sm.) Gould (*Agropyron dasystachyum*); Wheat Grass; occasional on sandy Lake Huron shores.

E. repens (L.) Gould (*Agropyron repens*); Quack Grass; common in old fields and roadsides.

E. trachycaulus (Link) Gould (*Agropyron trachycaulum*); Wheatgrass; occasional on open ground and on rocky shores and alvars.

Festuca occidentalis Hook.; Western Fescue; uncommon in open dry forests.

**F. rubra* L.; Red Fescue; occasional in old fields and dry roadsides.

F. saximontana Rydb.; Fescue; occasional in rocky areas and on dunes.

F. subverticillata (Pers.) E. B. Alexeev (*F. obtusa*); Nodding Fescue; occasional in deciduous forests.

Glyceria borealis (Nash) Batch.; Northern Manna Grass; occasional in shallow water with mud bottom.

G. canadensis (Michx.) Trin.; Rattlesnake Grass; EEW 2024 MICH; first Cockburn collection on October 9, 2000; occasional in boggy areas, including the cranberry marsh.

G. striata (Lam.) Hitchc.; Fowl Manna Grass; common in forest swamps.

Hierochloë hirta (Schrank) Borbás (*Hierochloë odorata*); Sweet Grass; local along moist roadsides and in damp old fields on the Indian Reserve and on the curve southeast of the Dump Road.

Milium effusum L.; Wood Millet; occasional in damp old fields, on shores, and in fens.

Muhlenbergia glomerata (Willd.) Trin.; Marsh Wild-timothy; rare; sight record by NHIC team in 2003 at Wagosh Bay.

Oryzopsis asperifolia Michx.; Tough-leaved Rice-grass; occasional in old fields and in coniferous forests.

Panicum capillare L.; Witch Grass; occasional along dry roadsides, in old fields, and on shores.

P. flexile (Gatt.) Scribn.; Witch grass; occasional on shores, in marshy areas, and along roadsides.

Phalaris arundinacea L.; Reed Canary-grass; common in wet areas.

**Phleum pratense* L.; Timothy; common in old fields, on shores, and along roadsides.

Piptatherum pungens (Spreng.) Dorn (*Oryzopsis pungens*); sight record by NHIC team in 2003 and 2014 at Wagosh Bay on cobble beach.

Phragmites australis (Cav.) Steud.; Reed; occasional on shores and in roadsides ditches. Only the native subsp. *americanus* Saltonst., P. M. Peterson & Soreng was found until 2013 when subsp. *australis* appeared along the newly opened 9th Concession and also in small area on along the beach in Doc Hewson Bay.

Poa alsodes A. Gray; Bluegrass; uncommon in *Acer saccharum* forests.

**P. annua* L.; Annual Bluegrass; common in old fields and disturbed areas.

**P. compressa* L.; Canada Bluegrass; common on dry roadsides, in old fields, and on rocky shores.

P. palustris L.; Fowl Meadow Grass; common in wet areas.

**P. pratensis* L.; Kentucky Bluegrass; common in grassy areas, open woods, and marshy areas.

P. saltuensis Fernald & Wiegand; Bluegrass; uncommon in deciduous forests.

Schedonorus pratensis (Huds.) P. Beauv. (*Festuca pratensis*); Meadow Fescue; common in old fields and roadsides.

Schizachne purpurascens (Torr.) Swallen; False Melic; occasional in sandy, coniferous forests.

Schizachyrium scoparium (Michx.) Nash (*Andropogon scoparius*); Little Bluestem; common on alvars.

Sphenopholis intermedia (Rydb.) Rydb.; Slender Wedgegrass; occasional along rocky shores and damp areas in forests.

POTAMOGETONACEAE (Pondweed Family)

Potamogeton berchtoldii Fieber.; Berchtold's Pondweed; occasional in shallow water in beaver ponds and stagnant, muddy water.

P. gramineus L.; Pondweed; occasional in sheltered lakes in deep to shallow water.

P. natans L.; Pondweed; occasional in lakes in shallow water.

P. richardsonii (A. Benn.) Rydb.; Richardson's Pondweed; occasional in lakes and marshes.

P. robbinsii Oakes; Pondweed; rare in shallow lakes.

Stuckenia filiformis (Pers.) Börner (*Potamogeton filiformis*); Narrow-leaved Pondweed; occasional in shallow water with sandy bottom.

TRILLIACEAE (Trillium Family) [LILIACEAE]

Trillium cernuum L.; Nodding Trillium; occasional in damp forest areas.

T. grandiflorum (Michx) Salisb.; Common Trillium; common in deciduous forests.

TYPHACEAE (Cat-tail and Bur-reed Family)

Sparganium emersum Rehm. (*S. chlorocarpum*); Bur-reed; EEW 2410 MICH; first Cockburn collection on August 6, 2014; seven plants were growing in 6 inches of mucky water in wet roadside ditch.

Typha latifolia L.; Common Cat-tail; occasional in standing water.

ANGIOSPERMS—DICOTS

ACERACEAE—see Sapindaceae

ADOXACEAE (Moschatel Family) [CAPRIFOLIACEAE]

Sambucus racemosa L.; Red-berried Elder; common in woods, thickets, stony ground, and on shores. Especially common near Dwarf Village in selectively-cut *Acer saccharum* woodlands.

Viburnum trilobum Marshall (*V. opulus*); American High-bush Cranberry; occasional in thickets, on shores, and along forest edges.

AMARANTHACEAE (Goosefoot or Pigweed Family) [CHENOPODIACEAE]

**Chenopodium album* L.; Lamb's Quarters; uncommon in disturbed soil and occasionally in the island dump.

Corispermum americanum (Nutt.) Nutt. (*C. hyssopifolium*); Bugseed; uncommon "along the L Huron shore in front of dunes" (Morton and Venn 2000). It was not found during the current survey.

**Salsola tragus* L. (*S. kali*); Russian Thistle; uncommon on sandy shores.

ANACARDIACEAE (Cashew Family)

Rhus typhina L.; Staghorn Sumac; occasional in rocky ground and hedgerows.

Toxicodendron rydbergii (Rydb.) Greene (*T. radicans*); Poison Ivy; abundant on rocky or sandy shores and in disturbed areas.

APIACEAE (Carrot or Parsley Family)

Cicuta bulbifera L.; Water Hemlock; occasional in roadside ditches, marshes, and on shores.

C. maculata L.; Water Hemlock; sight record by NHIC team in 2003 on cobble beach on Wagosh Bay.

Cryptotaenia canadensis (L.) DC.; Honewort; EEW 2375, EEW 2388 MICH; first Cockburn collection on April 6, 2012; rare along the sandy roadside at the west end of Matthews Field.

**Daucus carota* L; Queen-Anne's-lace; abundant in old fields, dry roadsides, and waste areas.

Heracleum maximum Bartram; Cow-parsnip; occasional in damp forest openings and wet roadside ditches.

Osmorhiza berteroi DC.; Sweet-cicely (*O. chilensis*); uncommon in deciduous and mixed forests.

O. claytonii (Michx.) C.B. Clarke; Hairy Sweet-cicely; common in beech-maple forests.

**Pastinaca sativa* L.; Wild Parsnip; occasional in ditches, marshes, and on shores.

Sanicula marilandica L.; Black Snakeroot; common in forests, especially in openings and along edges.

S. odorata (Raf.) K. M. Pryer & L. R. Phillippe (*S. gregaria*); Black Snakeroot; rare in deciduous forests on heavier soils.

Sium suave Walter; Water-parsnip; EEW 2409 MICH; first Cockburn collection on August 4, 2014; in 6" of mucky water in a wet ditch on the 10th Sideroad, 1.1 mile north of the 7th and 8th Concessions, west side of the road.

Taenidia integerrima (L.) Drude; Yellow-pimpernel; "Only known from dry sandy open woodland E. of Boom Pt." (Morton and Venn 2000). It was not found during the current survey.

APOCYNACEAE (Dogbane Family) [ASCLEPIADACEAE]

Apocynum androsaemifolium L.; Spreading Dogbane; occasional on roadsides, in grassy areas, and along edges of woods.

A. cannabinum L.; Indian-hemp; occasional on roadsides and shores.

Asclepias incarnata L.; Swamp Milkweed; occasional in marshes, swamps, and wet roadside ditches.

A. syriaca L.; Common Milkweed; common in sandy old fields and grassy areas.

**Vinca minor* L.; Periwinkle; EEW 2404 MICH; first Cockburn collection on May 28, 2014; rare but persisting in a colony of hundreds of plants near an old log farm cabin on the 12th Concession, 0.2 mile east of the 20th Sideroad.

AQUIFOLIACEAE (Holly Family)

Ilex verticillata (L.) A. Gray; Michigan Holly; Winterberry; uncommon in marshes and wet thickets.

ARALIACEAE (Ginseng family)

Aralia nudicaulis L.; Wild Sarsaparilla; occasional in woods.

A. racemosa L.; Spikenard; occasional in moist deciduous and mixed woods and below the limestone cliffs of the Bluff Hill Cliffs.

ASCLEPIADACEAE—see Apocynaceae

ASTERACEAE (Aster or Daisy Family)

Achillea millefolium L.; Yarrow; common in open, sunny areas, especially in old fields.

Ambrosia artemisiifolia L.; Common Ragweed; occasional in disturbed areas.

Anaphalis margaritacea (L.) Benth.; Pearly Everlasting; common on shores, dry roadsides, forest edges, and in grassland.

Antennaria howellii Greene; Pussy-toes; common on roadsides and on rocky ground.

A. parlinii Fernald; Smooth Pussy-toes; occasional in old fields.

**Anthemis cotula* L.; Dog Fennel; occasional on roadsides and in old fields.

**Arctium minus* Bernh.; Common Burdock; common in disturbed, open areas.

Artemisia campestris L.; Wormwood; common in sand on Lake Huron shores.

Bidens cernua L.; Nodding Beggar-ticks; common in wet ditches, swamps, and on shores.

B. frondosa L.; Common Beggar-ticks; common in wet disturbed areas and on shores.

**Centaurea jacea* L.; Brown Knapweed; EEW 2353 MICH; first Cockburn collection on September 1, 2010; rare in an old gravel pit.

**C. montana* L.; Mountain Knapweed; rare escape from cultivation.

**C. nigra* L.; Black Knapweed; common in old fields, roadsides, and gravel pits.

**C. stoebe* L.; Spotted Knapweed; EEW 2411 MICH; first Cockburn collection on August 7, 2014. Several hundred plants were growing in sandy gravel at the road edge, along with *Achillea millefolium, Hypericum perforatum,* and *Poa compressa*. Site is on the southeast corner of the intersection of the 20 th Sideroad and the 12th Concession.

**Cichorium intybus* L.; Chicory; common on roadsides and old fields.

**Cirsium arvense* (L) Scop.; Canadian-thistle; common on roadsides, in old fields, and on shores.

C. hillii (Canby) Fernald; Hill's Thistle; "grassy areas near shore of False Detour Channel" (Morton and Venn 2000). It was not found during the current study.

**C. palustre* (L). Scop.; Marsh Thistle, European Swamp Thistle; EEW 2387 MICH; first Cockburn collection June 19, 2012; rosettes were first seen in Robinson Bay in the Northern Wet Meadow in 2011.

C. pitcheri (Eaton.) Torr. & Gray; Pitcher's Thistle; locally abundant on Doc Hewson Bay, with a few plants on Sand Bay and Wagosh Bay.

**C. vulgare* (Savi) Tenore; Bull-thistle; common on roadsides, in old fields, and on shores.

Conyza canadensis (L.) Cronquist; Horseweed; on roadsides, in old fields, and on shores.

Coreopsis lanceolata L.; Sand Coreopsis; uncommon in sandy areas near shores (such as Sand Bay).

Doellingeria umbellata (Mill.) Nees (*Aster umbellatus*); Flat-topped Aster; common in marshy areas and wet ditches.

Erigeron annuus (L.) Pers.; Annual Fleabane; occasional in old fields and grassy areas.

E. philadelphicus L.; Marsh Fleabane; common on roadsides and in old fields.

E. strigosus Willd.; Daisy Fleabane; common on roadsides, old fields, and shores.

Eupatorium perfoliatum L.; Common Boneset; common in roadside ditches, marshes, and shores.

Eurybia macrophylla (L.) Cass. (*Aster macrophyllus*); Large- or Big-leaved Aster; common in a variety of woods; flowering is sporadic.

Euthamia graminifolia (L.) Nutt.; Grass-leaved Goldenrod; common in wet roadsides, old fields, marshes and on shores.

Eutrochium maculatum (L.) E. E. Lamont (*Eupatorium maculatum*); Joe-pye-weed; common in marshes, swamps, and marshy shores.

Gnaphalium uliginosum L.; Low Cudweed; uncommon in wet disturbed areas and roadsides.

**Helianthus annuus* L.; Garden Sunflower; uncommon on shores.

**H. pauciflorus* Nutt.; Prairie Sunflower; EEW 2290 MICH; first Cockburn collection on September 6, 2008; rare along a two-track road through the overgrown Goodmurphy Girls' Field.

**Hieracium aurantiacum* L.; Orange Hawkweed; abundant weed of grassy areas, rocky areas, and roadsides.

H. kalmii L.; Canada Hawkweed; occasional in sandy and rocky areas.

**H. lachenalii* C. C. Gmel.; European Hawkweed; old record from grassy area on shore at abandoned Indian village (Morton and Venn 2000).

**H. piloselloides* Vill.; Yellow Hawkweed; common on roadsides, gravel pits, old fields, and shores.

Lactuca biennis (Moench) Fernald; Tall Blue Lettuce; uncommon on roadsides and in forest clearings.

L. canadensis L.; Wild Lettuce; common on roadsides, shores, and logging staging sites.

**Leucanthemum vulgare* Lam. (*Chrysanthemum leucanthemum*); Ox-eye Daisy; common on roadsides, in old fields, and on shores.

Liatris cylindracea Michx.; Cylindrical Blazing Star; uncommon on rocky areas.

**Matricaria discoidea* DC.; Pineapple-weed; occasional in grassy areas and roadsides.

**Mycelis muralis* (L.) Dumort. (Lactuca muralis); Wall Lettuce; EEW 2389 MICH; first Cockburn collection on June 19, 2012; seedlings first seen in 2011 and rapidly expanding along the Cross-over Road and in Grace's Hardwoods on the 15th Concession Road, near the road to Rickett's Harbor.

Packera aurea (L.) Á. Löve & D. Löve (*Senecio aureus*); Golden Ragwort; occasional in marshes and roadside ditches.

P. obovata (Willd.) W. A. Weber & Á. Löve (*Senecio obovatus*); Round-leaved Ragwort; EEW 3065 MICH; first Cockburn collection June 25, 2011; locally abundant on Tea-Kettle Alvar. "Southernmost Michigan is along the northwest edge of the range of this species," (Reznicek et al. 2011), so the Cockburn population is quite a distance from the Michigan range.

P. paupercula (Michx.) Á. Löve & D. Löve (*Senecio pauperculus*); Balsam Ragwort; common on shores, in thin woodland, and in forest openings.

Petasites frigidus (L.) Fries; Sweet-coltsfoot; EEW 2346 MICH; occasional in coniferous forest, *Thuja occidentalis* swamps, and moist roadsides, on the curve southeast of the Dump Road.

Prenanthes alba L.; White Lettuce; uncommon in deciduous forests.

P. racemosa Michx.; Glaucous White Lettuce; uncommon along forest edges and shores.

Pseudognaphalium macounii (Greene) Kartesz (*Gnaphalium macounii*); Clammy Cudweed; occasional in woodland openings and on roadsides.

Rudbeckia hirta L.; Black-eyed Susan; common in old fields and on roadsides.

Solidago altissima L.; Tall Goldenrod; common in old fields, woodland openings, and on shores.

S. canadensis L.; Canada Goldenrod; occasional in old fields and on shores.

S. gigantea Aiton; Late Goldenrod; occasional in marshes and on shores.

S. hispida Willd.; Hairy Goldenrod; common in grassy and sandy areas.

S. houghtonii A. Gray; Houghton's Goldenrod; EEW 2258, EEW 2399 MICH; locally abundant on the eastern portion of Sand Bay and on Doc Hewson Bay. It is a Great Lakes region endemic and the farthest east that the Great Lakes strain grows.

S. nemoralis Aiton; Old-field Goldenrod; common in grassy areas.

S. ohioensis Riddell; Ohio Goldenrod; common in marshes and on shores.

S. ptarmicoides (Torr. & A. Gray) B. Boivin; Upland White Solidago; Sneezewort Goldenrod; occasional on shores.

S. rugosa Mill.; Rough-leaved Goldenrod; occasional in marshes.

S. uliginosa Nutt.; Bog Goldenrod; common on swampy shores and in fens.

**Sonchus arvensis* L.; Field Sow-thistle; common on roadsides and in old fields.

Symphyotrichum ciliolatum (Lindl.) Á. Löve & D. Löve (*Aster ciliolatus*); Lindley's Aster; common on roadsides, forest trails, and in old fields.

S. laeve (L.) Á. Löve & D. Löve (*Aster laevis*); Smooth Aster; common on roadsides and rocky shores.

S. lanceolatum (Willd.) G. L. Nesom (*Aster lanceolatus*); Panicled Aster; common in marshes, roadside ditches, and on shores.

S. lateriflorum (L.) Á. Löve & D. Löve (*Aster lateriflorus*); Calico Aster; common in shady areas in forests, on shores, in old fields, and along roadsides.

S. pilosum (Willd.) G. L. Nesom var. *pringlei* (A. Gray) G. L. Nesom (*Aster pilosus*); Frost Aster; common in wet areas along shores.

S. puniceum (L.) Á. Löve & D. Löve (*Aster puniceus*); Swamp Aster, Purple-stemmed Aster; common in marshes and roadside ditches.

Tanacetum bipinnatum subsp. *huronense* (Nutt.) Breitung (*T. huronense*); Lake Huron Tansy; reported as a "single patch on the dunes in Wagosh Bay" (Morton and Venn 2000). In 2003the NHIC team noted a "large patch growing in the dunes" of Wagosh Bay.

**T. balsamita* L.; Costmary; sight record by Sam Brinkerin 2014.

**T. vulgare* L.; Common Tansy; common along shores and roadsides.

**Taraxacum erythrospermum* Besser; Red-seeded Dandelion; occasional on shores and in sandy areas.

**T. officinale* F. H.Wigg.; Common Dandelion; common on roadsides, in grassy areas, in old fields, and on shores.

**T. palustre* (Lyons) Symons; Marsh Dandelion; EEW 2408 MICH; first Cockburn collection on June 2, 2014; locality found by Frederick W. Schueler and Aleta Karstad; growing in mowed grass near the Government Dock, in a mixed population with *T. officinale*.

**Tragopogon dubius* Scop.; Goat's-beard; occasional on roadsides, in old fields, and on shores.

**Tussilago farfara* L.; Coltsfoot; EEW 2402 MICH; first Cockburn collection on May 26, 2014; about 100 plants in a wet roadside ditch, with scattered plants downstream for 75 feet. The plants were eradicated by NCC personnel on June 1, 2014. Another site was found on the NCC/MNR (NHIC) 2014 trip to the Wagosh Bay area (pers. comm., Judith Jones, June 2, 2014).

BALSAMINACEAE (Touch-me-not Family)

Impatiens capensis Meerb.; Spotted Touch-me-not; abundant in marshes and swampy areas; "a form with small cleistogamous flowers and an unbranched stem occurs in swampy deciduous woods near Cinder Pt. (Morton and Venn 2000). The unusual form was not found during the current study.

BERBERIDACEAE (Barberry Family)

Caulophyllum thalictroides (L.); Blue Cohosh; uncommon in rich, slightly damp soils of deciduous forests.

BETULACEAE (Birch Family)

Alnus incana (L.) Moench (*A. rugosa*); Tag Alder; common on shores and in thickets "where the ground water is flowing and aerated" (Morton and Venn 2000).

Betula alleghaniensis Britton; Yellow Birch; occasional in damp, rich deciduous forest and in rocky forests.

B. papyrifera Marshall; Paper Birch; abundant in most dry woods and hedgerows; seeds in quickly after fire and disturbance.

Corylus cornuta Marshall; Beaked Hazelnut; common along forest edges and roadsides.

Ostrya virginiana (Mill.) K. Koch; Ironwood, Hop Hornbeam; abundant in forest understory and rocky areas.

BORAGINACEAE (Borage Family)

Cynoglossum boreale Fernald; Northern Comfrey; common along trails in the woods and in grassy clearings.

**C. officinale* L.; Common Hound's-tongue; occasional along trails in the woods and in disturbed areas.

Hackelia deflexa (Wahlenb.) Opiz; Stickseed; occasional in moist woods.

**Lappula squarrosa* (Retz.) Dumort; Stickseed; uncommon along roadsides and in old fields.

BRASSICACEAE (Mustard Family) [CRUCIFERAE]

**Alliaria petiolata* (M. Bieb.) Cavara & Grande; Garlic Mustard; EEW 2339, EEW 2382 MICH; first Cockburn collection on May 11, 2012; locally abundant and spreading by logging trucks and other vehicles in recently-logged woods, especially along the Cross-over Road and the Huron Timber Dock Road.

Arabis pycnocarpa M. Hopkins (*Arabis hirsuta*); Hairy Rock Cress; occasional on sandy shores on south side of island.

Arabidopsis lyrata (L.) O'Kane & Al-Shehbaz (*Arabis lyrata*); Sand Cress; occasional on dry, sandy areas on south side of the island, especially along Sand Beach.

**Barbarea vulgaris* W. T. Aiton; Yellow Rocket; common in roadside ditches and on shores.

Boechera grahamii (Lehmann) Windham & Al-Shehbaz (*Arabis divaricarpa*); Rock-cress; common on rocky shores and alvars.

B. retrofracta (Graham) Á. Löve & D. Löve (*Arabis holboellii*); Rock Cress; occasional on sandy shores on south side of island.

B. stricta (Graham) Al-Shehbaz (*Arabis drummondii*); Drummond Rock Cress; rare in disturbed sites.

Cakile edentula (Bigelow) Hook.; Sea Rocket; occasional on sandy shores on south side of island.

**Capsella bursa-pastoris* (L.) Medic.; Shepherd's Purse; occasional weed of roadsides and old fields.

Cardamine concatenata (Michx.) O. Schwarz (*Dentaria laciniata*); Cut-leaved Toothwort; occasional in deciduous forests.

C. diphylla (Michx.) Alph. Wood (*Dentaria diphylla*); Two-leaved Toothwort; occasional in deciduous forests.

**Descurainia pinnata* (Walter) Britton; Tansy Mustard; occasional on shores and roadsides.

**Erysimum cheiranthoides* L.; Wormseed Mustard; occasional on roadsides and in old fields.

**E. inconspicuum* (S. Watson) MacMill.; Small Wormseed Mustard; occasional on roadsides.

**Hesperis matronalis* L.; Dame's-rocket; occasional on disturbed land (escape from cultivation).

**Lepidium campestre* (L.) W. T. Aiton; Field Cress; occasional on roadsides and in disturbed areas.

**Nasturtium macrophyllum* Rchb.; Watercress; locally abundant in Sand Creek on the Cross-over Road and in the creek on the 12th Concession, east of the 20 th Sideroad.

Rorippa palustris (L.) Besser; Yellow Cress; occasional on shores and beaver dams.

**Thlaspi arvense* L.; Penny Cress; occasional on roadsides and in disturbed areas.

Turritis glabra L. (*Arabis glabra*); Tower Mustard; occasional in rocky areas and roadsides.

CALLITRICHACEAE—see Plantaginaceae

CAMPANULACEAE (Bellflower Family)

Campanula aparinoides Pursh.; Marsh Bellflower; occasional in swamps and marshes.

C. rotundifolia L.; Bellflower; common in rocky areas on shores and roadsides near shores.

Lobelia cardinalis L.; Cardinal-flower; locally abundant in wet ditches and marshes, especially along the 12th Concession, east of the 15th Sideroad.

L. kalmii L.; Kalm's Lobelia; locally abundant on shores.

CANNABACEAE (Hemp Family)

**Humulus lupulus* L.; Common Hops; EEW 2403 MICH; first Cockburn collection May 27, 2014; scattered around an old farm site on the 12th Concession, east of the 20th Sideroad.

CAPRIFOLIACEAE (Honeysuckle Family)—see also Adoxaceae, Diervillaceae, and Linnaeaceae

Lonicera canadensis Marshall; Fly Honeysuckle; common in coniferous and mixed forests.

L. dioica L.; Twining Honeysuckle; occasional in thickets, roadsides, woods, and on shores.

L. hirsuta Eaton; Hairy Honeysuckle; uncommon in rocky areas in woods.

L. oblongifolia (Goldie) Hook.; Swamp Honeysuckle; uncommon in fens and on damp shores.

Symphoricarpos albus (L.) S. F. Blake; Snowberry; occasional in rocky areas, thin, dry coniferous woods, and on alvars.

CARYOPHYLLACEAE (Pink Family)

Arenaria serpyllifolia L.; Thyme-leaved Sandwort; common on roadsides and on rocky shores.

Cerastium arvense L.; Field Chickweed; occasional on shores.

**C. fontanum* Baumg.; Mouse-ear Chickweed; occasional in grassy areas and old fields.

C. nutans Raf.; Nodding Chickweed; occasional in open, disturbed areas in woods.

**Gypsophila scorzonerifolia* Ser.; Baby's Breath; EEW 2027, EEW 2269 MICH; locally abundant on sand beaches of Sand Bay and Doc Hewson Bay. It is a threat to the populations of *Solidago houghtonii* that grow in close proximity.

Minuartia michauxii (Fenzl) Farwell (*Arenaria stricta*); Rock Sandwort; occasional on rocky and sandy shores.

**Silene latifolia* Poir. (*S. pratensis*); White Catchfly; occasional on roadsides, in old fields, and on shores.

**S. noctiflora* L.; Night-flowering Catchfly; occasional on roadsides, in old fields, and on shores.

**S. vulgaris* (Moench) Garcke; Bladder Campion; common on roadsides, in old fields, and on shores.

Stellaria borealis Bigelow (*S. calycantha*); Northern Chickweed; uncommon in damp woodland.

**S. graminea* L.; Common Stitchwort; common in wet grassy areas, along roadsides, and in old fields.

**S. media* (L.) Vill.; Chickweed; common in disturbed ground on roadsides, in old fields, on trails, and in lawns.

CELASTRACEAE (Bittersweet Family)

Celastrus scandens L.; Climbing Bittersweet; uncommon in old fields.

CHENOPODIACEAE—see Amaranthaceae

COMPOSITAE—see Asteraceae

CONVOLVULACEAE (Morning-glory Family)

Calystegia spithamaea (L.) Pursh; Low Bindweed; EEW 2386 MICH; first Cockburn collection on June 19, 2012; found in sandy soil on the overgrown Matthews Field at the edge of a *Quercus rubra*/*Acer saccharum* woods.

CORNACEAE (Dogwood Family)

Cornus alternifolia L. f.; Alternate-leaved Dogwood; common in deciduous and mixed forests.

C. canadensis L.; Bunchberry; common in coniferous and mixed forests.

C. rugosa Lam.; Round-leaved Dogwood; common in forests, forest openings, and rocky areas.

C. sericea L. (*C. stolonifera*); Red-osier; common in wet areas and old fields.

CRASSULACEAE (Orpine Family)

**Hylotelephium telephium* (L.) H. Ohba (*Sedum telephium*); Live-forever; occasionally persisting after cultivation and on roadsides.

**Sedum acre* L.; Mossy Stonecrop; sight records by NHIC team in 2003 and 2014 on sand dune in the Wagosh Bay area.

CRUCIFERAE—see Brassicaceae

DIERVILLACEAE (Bush-honeysuckle Family)

Diervilla lonicera Mill.; Bush Honeysuckle; occasional in openings in the woods and along shores.

DIPSACACEAE (Teasel Family)

**Dipsacus fullonum* L.; Wild Teasel; EEW 2360 MICH; first Cockburn collection on November 7, 2010; locally abundant in (and along) a sunny logging road through an overgrown field, with *Abies balsamea* saplings.

DROSERACEAE (Sundew Family)

Drosera anglica Huds.; English Sundew; EEW 2348 MICH; first Cockburn collection on August 25, 2010; very rare in slightly raised area in wet sand on eastern end of Sand Bay in a mixed population of *D. linearis* and *D. rotundifolia*.

D. linearis Goldie; Linear-leaved Sundew; locally abundant on wet sand of Sand Bay, at the southern end of the Connell Trail, and in moist areas of Doc Hewson Bay.

D. rotundifolia L.; Round-leaved Sundew; common in cedar swamps, bogs, on boggy shores, and in wet roadside ditches.

ELAEAGNACEAE (Oleaster Family)

Shepherdia canadensis (L.) Nutt.; Soapberry; common in rocky areas, on alvars, in thin, woodland edges, and on drier portion of shores.

ERICACEAE (Heath Family) [Monotropaceae; Pyrolaceae]

Arctostaphylos uva-ursi (L.) Spreng.; Bearberry, Kinnikinick; abundant in rocky areas, on alvars, and in open coniferous woods.

Chimaphila umbellata (L.) W. P. C. Barton; Pipsissewa; occasional in open, coniferous forests.

Epigaea repens L.; Trailing Arbutus; EEW 2377 MICH; first Cockburn collection on April 6, 2012; locally abundant on *Sphagnum* hummocks on the Connell Trail, northeast of Sand Creek along the Cross-over Road, and in scattered damp, sandy roadside ditches.

Gaultheria hispidula (L.) Bigelow; Creeping Snowberry; occasional in cedar swamps and coniferous forests, often found trailing over old stumps.

G. procumbens L.; Teaberry, Wintergreen; EEW 2395 MICH; first Cockburn collection on August 3, 2012; locally abundant in damp, acid areas. Found on *Sphagnum* hummocks on the Connell Trail, northeast of Sand Creek along the Cross-over Road, and in scattered damp, sandy roadside ditches.

Gaylussacia baccata (Wangenh.) K Koch; Huckleberry; "[d]ubious inland record in the vicinity of Rickett's Harbour" (Morton and Venn 2000). It was not found during the current study.

Hypopitys monotropa Crantz (*Monotropa hypopithys*); Pinesap, False beech-drop; (EEW 2373 MICH); local in an *Acer saccharum/Quercus rubra* woods on the Indian Reserve.

Kalmia angustifolia L.; Sheep-laurel; uncommon plant in boggy area at east end of Sand Bay.

Moneses uniflora (L.) A. Gray; One-flowered Pyrola; occasional in mixed and coniferous forests.

Monotropa uniflora L.; Indian Pipe; occasional clumps in forests.

Orthilia secunda (L.) House; One-sided Pyrola; common in dry coniferous and deciduous forests.

Pterospora andromedea Nutt.; Pine-drops, Giant Bird's Nest; EEW 2270 MICH; extremely rare in thin mixed woods of *Abies balsamea, Betula papyrifera* and *Pinus strobus*; first collected on the island in 1870 and not seen again until the author's collection of a dried fruiting stalk on October 15, 2007. Two adjacent plants have flowered sporadically since then.

Pyrola asarifolia Michx.; Pink Pyrola; occasional in coniferous forests.

P. chlorantha Sw.; Shinleaf; occasional in coniferous forests.

P. elliptica Nutt.; Large-leaved Shinleaf; occasional in coniferous forests.

Rhododendron groenlandicum (Oeder) Kron & Judd (*Ledum groenlandicum*); Labrador Tea; local in bogs, cedar swamps, and in swampy coniferous forests.

Vaccinium angustifolium Aiton; Low Sweet Blueberry; EEW 2384 MICH; rare in sandy coniferous woodland on low dunes behind Sand Bay and sporadically in other oak and pine woods.

V. macrocarpon Aiton; Large Cranberry; EEW 2023 MICH; first Cockburn collection on October 9, 2000; locally abundant in emergent marsh off the Harper's Trail, west of the 20th Side Road.

V. myrtilloides Michx.; Velvetleaf or Canada Blueberry; EEW 2347 MICH; first Cockburn collection on May 23, 2010; scattered plants on Tea Kettle Alvar.

V. oxycoccos L.; Small Cranberry; common in cedar swamps, bogs, and wet roadside ditches.

FABACEAE (Pea Family)

Lathyrus japonicus Willd.; Beach Pea; uncommon on sandy shores of Lake Huron.

L. ochroleucus Hook.; Pale Vetchling; uncommon in open forests.
L. palustris L.; Marsh Pea; common in marshy areas and on shores.
**Medicago lupulina* L.; Black Medick; common in disturbed areas.
**Melilotus alba* Medik.; White Sweet-clover; common in old fields and on shores.
**M. officinalis* (L.) Pall.; Yellow Sweet-clover; common in old fields.
**Robinia pseudoacacia* L.; Black Locust; planted and occasionally escaped on roadsides.
**Trifolium hybridum* L.; Alsike Clover; common in old fields, on roadsides, and on shores.
**T. pratense* L.; Red Clover; common in old fields, on roadsides, and on shores.
**T. repens* L.; White Clover; common in old fields, on roadsides, and on shores.
Vicia americana Willd.; American Vetch; occasional in grassy areas and thin forests.
**V. cracca* L.; Bird Vetch; common in old fields and roadsides.

FAGACEAE (Beech Family)
Fagus grandifolia Ehrh.; American Beech; abundant in deciduous woodland.
Quercus rubra L.; Red oak; occasional in dry sites and at the edge of deciduous forests; common on the Indian Reserve.

GENTIANACEAE (Gentian Family)
Gentianopsis virgata (Raf.) Holub (*G. procera*); Fringed Gentian; common on alkaline shores; white-flowered plants are found along the shore south of the Indian Reserve dock.
Halenia deflexa (Sm.) Griseb.; Spurred Gentian; common in swampy areas and coniferous forests, especially along edges.

GERANIACEAE (Geranium Family)
Geranium robertianum L.; Herb Robert; occasional in thin soil and cracks on cobble shores and in disturbed forests.

GROSSULARIACEAE (Gooseberry Family)
Ribes americanum Mill.; Wild Black Currant; EEW 2400 MICH; first Cockburn collection on May 26, 2014; occasional on seepage slopes.
R. glandulosum Grauer; Skunk Currant; occasional in swampy forests.
R. hirtellum Michx.; Swamp Gooseberry; common on rocky shores, stony ground, and in thin woodland.
R. lacustre (Pers.) Poir.; Swamp Black Currant; common in coniferous and mixed forests.
**R. odoratum* H. W. Wendl; Golden Currant; occasional garden escape to nearby hedgerows.
R. triste Pall.; Swamp Red Currant; common in woodland and swamp forests.

GUTTIFERAE—see Hypericaceae

HALORAGACEAE (Water-milfoil Family)
Myriophyllum sibiricum Komarov (*M. exalbescens*); Water-milfoil; occasional in standing water.
Proserpinaca palustris L.; Mermaid-weed; occasional in fens.

HIPPURIDACEAE—see Plantaginaceae

HYPERICACEAE (St. John's-wort Family) [GUTTIFERAE]
Hypericum kalmianum L.; Kalm's St. John's-wort; occasional in fens and along the Lake Huron shores, especially in damp, sandy areas.
H. majus (A. Gray) Britton; Larger Canadian St. John's-wort; uncommon on shores, in roadside ditches, and in gravel pits.
**H. perforatum* L.; Common St. John's-wort; common on roadsides, in gravel pits,on grassy areas, and in old fields.
Triadenum fraseri (Spach) Gleason; Marsh St. John's-wort; uncommon in swampy areas.

JUGLANDACEAE (Walnut Family)
**Juglans nigra* L.; Black Walnut; the tree planted in a hedgerow of an old field north of the 14th Concession, east of the 20th Sideroad, is now a full-grown tree; there are planted small trees around homes.

LAMIACEAE (Mint Family)
**Clinopodium acinos* (L.) Kuntze (*Acinos arvensis*); Mother-of-thyme; common in old fields, on shores, and on stony ground.

C. arkansanum (Nutt.) House (*Calamintha arkansana*); Limestone Calamint; aromatic mint that is common on calcareous, damp shores.
C. vulgare L.; Wild Basil; common on roadsides and on shores.
Dracocephalum parviflorum Nutt.; Dragonhead; uncommon in sandy open areas.
**Galeopsis tetrahit* L.; Hemp-nettle; occasional in disturbed soils and on gravelly shores.
Lycopus americanus W. P. C. Barton; Common Water-horehound; common in marshes, wet ditches, woods, and on shores.
L. uniflorus Michx.; Northern Bugle Weed; common in marshes, wet ditches, and on shores.
Mentha canadensis L. (*M. arvensis*); Wild Mint; common in marshes, roadside ditches, and on shores.
**M.* × *piperita* L.; Peppermint; occasional in streams and roadside ditches.
**M. spicata* L.; Spearmint; occasional in roadside ditches as a garden escape.
Monarda fistulosa L.; Wild Bergamot; common in old fields.
**Nepeta cataria* L.; Catnip; common on roadsides and "the dump."
Prunella vulgaris L.; Self-heal; common along forest trails and shores.
Scutellaria galericulata L.; Marsh Skullcap; common in marshy areas.
S. lateriflora L.; Mad-dog Skullcap; common in marshy areas.

LENTIBULARIACEAE (Bladderwort Family)
Utricularia cornuta Michx.; Horned Bladderwort; common in wet sand swales.
U. intermedia Hayne; Flat-leaved Bladderwort; occasional in shallow water of swamps and marshes.
U. vulgaris L.; Common Bladderwort; occasional in swamps.

LINNAEACEAE (Twinflower Family) [CAPRIFOLIACEAE]
Linnaea borealis L.; Twinflower; common in coniferous and mixed forests.

LYTHRACEAE (Loosestrife Family)
**Lythrum salicaria* L.; Purple Loosestrife; EEW 2396 MICH; first Cockburn collection on August 30, 2012; very rare: a small area of this invasive was found by islander Arlene McQuarrie on the 10 th Sideroad, north of the 7th and 8th Concession. The author destroyed the remaining plants.

MALVACEAE (Mallow Family) [TILIACEAE]
**Hibiscus trionum* L.; Flower-of-an-hour; collected once in an old field in 1932 (Morton and Venn 2000).
Tilia americana L.; Basswood, Linden; occasional in deciduous forests and in hedgerows, often with *Fagus grandifolia* and *Acer saccharum*. Also found growing in the rubble at the bottom of the limestone quarry cliffs.

MENYANTHACEAE (Buckbean Family)
Menyanthes trifoliata L.; Buckbean; occasional in swampy areas.

MONOTROPACEAE—see Ericaceae

MONTIACEAE (Montia Family) [PORTULACACEAE]
Claytonia caroliniana Michx.; Spring-beauty; common in deciduous forests.

MYRICACEAE (Bayberry Family)
Myrica gale L.; Sweet Gale; common in swampy areas, marshes (abundant in the large cranberry marsh), and fens.

MYRSINACEAE (Myrsine Family) [PRIMULACEAE]
Lysimachia ciliata L.; Fringed Loosestrife; known from ". . . a swampy roadside 2 to 3 miles S of Tolsmaville . . ." (Morton and Venn 2000). It was not found on the current survey.
L. terrestris (L.) Britton, Sterns & Poggenb.; Swamp Candles; occasional in marshes, swamps, on shores, and in fens.
L. thyrsiflora L.; Tufted Loosestrife; occasional in swamps, on shores, in fens, and in openings in forests.
Trientalis borealis Raf.; Star-flower; abundant in coniferous and mixed forests.

NYMPHAEACEAE (Water-Lily Family)
Nuphar variegata Durand; Yellow Water-lily; common in quiet water of ponds and marshes.

OLEACEAE (Olive Family)

Fraxinus nigra Marshall; Black Ash; common in wet woods and on shores.

F. pennsylvanica Marshall; Red Ash; abundant in wet woods, roadsides, on rocky ground, and shores.

**Ligustrum ovalifolium* Hassk.; California Privet; "[a] relic of cultivation on the outskirts of Tolsmaville." (Morton and Venn 2000). It was not found on the current survey.

**Syringa vulgaris* L.; Common Lilac; frequently planted and persisting around old farms and camps; also escapes occasionally to nearby old fields and hedgerows.

ONAGRACEAE (Evening-Primrose Family)

Chamerion angustifolium (L.) Holub (*Epilobium angustifolium*); Fireweed; occasional on roadsides, shores, in clearings, and on forest edges.

Circaea alpina L.; Small Enchanter's Nightshade; occasional in rich soil, on rotting logs in deciduous and mixed forests, and on seepage slopes.

C. canadensis (L.) Hill; (*C. lutetiana*); occasional in marshes, roadside ditches, and on shores.

Epilobium ciliatum Raf.; Willow-herb; common in wet places along ditches, shores, streams, and disturbed areas by roads through cedar swamps.

E. leptophyllum Raf.; Fen Willow-herb; occasional in marshes, swamps, and damp forest openings.

Oenothera biennis L.; Common Evening-primrose; occasional in disturbed ground in old fields, roadsides, on shores, and in gravel pits.

OROBANCHACEAE (Broom-rape Family) [SCROPHULARIACEAE]

Agalinis purpurea (L.) Pennell; Purple Gerardia; occasional on shores and in interdunal swales.

Castilleja coccinea (L.) Spreng.; Indian Paintbrush; occasional on shores and in interdunal swales.

Conopholis americana (L.) Wallr.; Squaw-root; EEW 2350, EEW 2366 MICH; first Cockburn collection on August 28, 2010; locally abundant in *Acer saccharum* forests on rocky soil on the Indian Reserve.

Epifagus virginiana (L.) W.P.C. Barton; Beech-drops; locally common with its host, *Fagus grandifolia*.

**Euphrasia stricta* J.F. Lehm.; Eyebright; uncommon in open, grassy areas.

Melampyrum lineare Desr.; Cow-wheat; common in open coniferous forests and on forest edges. It is parasitic on a variety of herbaceous and woody species.

Orobanche uniflora L.; Broom-rape; EEW 2383 MICH; rare in a rocky *Acer saccharum* forested area on the Indian Reserve and in sand near Sand Bay in *Thuja occidentalis* openings.

PAPAVERACEAE (Poppy Family)

Adlumia fungosa (Aiton) Britton, Sterns & Poggenb; Climbing Fumitory; EEW 2013 MICH; first Cockburn collection on October 7, 2000; very rare but found abundantly in 2000, 2001, and 2002 along newly opened sections of a logging road in mixed forest along the Huron Timber Dock Road. Not seen again after 2003.

Capnoides sempervirens (L.) Pers. (*Corydalis sempervirens*); Pale Corydalis, Rock Harlequin; "Recorded from island by Bell (1870) without precise information and no specimen found" (Morton and Venn 2000). It was not found during the current study.

Corydalis aurea Willd.; Golden Corydalis; uncommon on rocky ground and in disturbed areas on roadsides.

Dicentra cucullaria (L.) Bernh.; Dutchman's-breeches; occasional in rich woods.

PARNASSIACEAE (Grass-of-parnassus Family)

Parnassia glauca Raf.; Grass-of-Parnassus; common in fens, on damp, sandy shores, and in interdunal swales.

P. parviflora DC.; Grass-of-Parnassus; EEW 2256 MICH; first Cockburn collection on July 15, 2007; rare on damp, sandy shores, especially on Sand Bay east of the mouth of Sand Creek.

PHRYMACEAE (Phryma Family) [SCROPHULARIACEAE]

Mimulus moschatus Lindl.; Muskflower; "(r)are and found in a spring in open woodland on McQuaig's [sic] Hill, Cockburn Isl…" (Morton and Venn 2000). It was not found on the current study.

M. ringens L.; Monkey-flower; occasional in marshes and swamps.

PLANTAGINACEAE (Plantain Family) [CALLITRICHACEAE; HIPPURIDACEAE; SCROPHULARIACEAE]

Callitriche palustris L. (*C. verna*); Water Starwort; uncommon in ditches and shaded ponds.

Hippuris vulgaris L.; Mare's Tail; uncommon in muddy, calm water.

**Plantago lanceolata* L.; English Plantain; common on roadsides, in old fields, and on rocky shores.

**P. major* L.; Common Plantain; common in open, disturbed ground.

P. rugelii Decne.; Rugel's Plantain; uncommon along trails in deciduous forests.

Veronica anagallis-aquatica L.; Water Speedwell; occasional on shores.

**V. arvensis* L.; Field Speedwell; occasional in dry, rocky and sandy ground.

V. beccabunga L. var. *americana* Raf.; Brooklime; EEW 2385 MICH; occasional in deciduous forests, along shores, in beaver ponds and in the *Thuja occidentalis* swamp at the east end of Sand Bay.

**V. officinalis* L.; Common Speedwell; occasional along trails in deciduous forests and in grassy areas.

V. peregrina L.; Purslane Speedwell; occasional in damp areas on shores, roadsides, and deciduous forest trails.

V. serpyllifolia L.; Thyme-leaved Speedwell; occasional on damp deciduous forest trails.

POLYGALACEAE (Milkwort Family)

Polygala paucifolia Willd.; Gay-wings; common in coniferous and mixed forests. Pure white forms are often found in the forest around the east end of Robinson Bay.

P. senega L.; Seneca Snakeroot; sight record by NHIC team in 2003 at Wagosh Bay on cobble beach.

POLYGONACEAE (Smartweed Family)

**Fallopia sachalinensis* (F. Schmidt) Ronse Decr. (*Polygonum sachalinense*); Giant Knotweed; EEW 2012 MICH "[f]orming a dense thicket in a derelict clearing W. of Tolsmaville, Cockburn Is." (Morton and Venn 2000). The plants were still in existence at time of this study and are spreading throughout the site.

Persicaria amphibia (L.) Delarbre (*Polygonum amphibium*); Water Smartweed; occasional in marshy ground and calm water.

P. lapathifolia (L.) Delarbre (*Polygonum lapathifolium*); Nodding Smartweed; occasional in damp, disturbed land and on shores.

P. punctata (Elliott) Small; (*Polygonum punctatum*); Smartweed; common in roadside ditches, and on shores.

Polygonum ramosissimum Michx; Bushy Knotweed; uncommon on Lake Huron shores.

**Rumex acetosella* L.; Sheep Sorrel; common in disturbed ground in sandy soils.

**R. crispus* L.; Curly Dock; common along damp roadsides, on shores, and in old fields.

**R. obtusifolius* L.; Bitter Dock; occasional along logging trails in deciduous forests.

PORTULACACEAE (Purslane Family)—see also Montiaceae

Portulaca oleracea L.; Common Purslane; occasional in gardens and disturbed soil.

PRIMULACEAE (Primrose Family)—see also Myrsinaceae

Primula mistassinica Michx.; Bird's-eye Primrose, Dwarf Canadian Primrose; common along calcareous lake shores and in fens.

RANUNCULACEAE (Buttercup Family)

Actaea pachypoda Elliott; White Baneberry, Doll's-eyes; common in deciduous forests.

A. rubra (Aiton) Willd.; Red Baneberry; common in deciduous and mixed forests.

**Anemone blanda* Schott & Kotschy; Mediterranean Anemone; EEW 2280 MICH; first Cockburn collection on May 4, 2008; locally abundant in a semi-shaded, grassy area just north of the 12th Concession Road on Lot 26.

A. canadensis L.; Canada Anemone; common in forest openings and on stream banks.
A. multifida Poir.; Red Anemone; uncommon in dry, sandy areas on Lake Huron shores, especially on Sand Beach.
A. quinquefolia L.; Wood anemone; EEW 2342 MICH; first Cockburn collection on May 1, 2010; rare along a wooded roadside along the Cross-over Road.
A. virginiana L.; Thimbleweed; common in deciduous forests and roadsides.
Aquilegia canadensis L.; Wild Columbine; common in open, dry areas, particularly with thin soil and a rocky substrate.
Caltha palustris L.; Marsh-marigold; common in seepage areas and in streams.
Clematis virginiana L.; Virgin's Bower; occasional in damp forested edges.
Coptis trifolia (L.) Salisb.; Goldthread; common in cedar swamps.
Hepatica americana (DC.) Ker Gawl.; Round-lobed Hepatica; common in dry coniferous forests.
Ranunculus abortivus L.; Small-flowered Buttercup; common in damp coniferous forests.
**R. acris* L.; Tall Buttercup; common in disturbed ground, in old fields, on roadsides, and rocky shores.
R. longirostris Godr.; White Water Crowfoot; occasional in ditches, slow-moving streams, and shallow lakes.
R. pensylvanicus L. f.; Bristly Crowfoot; occasional in wet roadside ditches, on beaver dams, and shores.
R. recurvatus Poir.; Hooked Crowfoot; common on trails in wet, deciduous forests.
R. reptans L.; Creeping Buttercup; occasional on shores of inland lakes.
Thalictrum dasycarpum Fisch. & Ave-Lall.; Purple Meadow-rue; occasional in marshes, damp deciduous forests, and on shores.
T. dioicum L.; Early Meadow-rue; EEW 2405 MICH; first Cockburn collection on May 28, 2014; rare in *Acer saccharum/Quercus rubra* woods on the Indian Reserve.

RHAMNACEAE (Buckthorn Family)
Rhamnus alnifolia L'Her.; Alder-leaved Buckthorn; common in swamps, fens, on damp roadsides, and in swales.

ROSACEAE (Rose Family)
Agrimonia gryposepala Wallr.; Tall Agrimony; common along deciduous forest trails and in openings.
Amelanchier humilis Wiegand (*A. spicata*); Low Juneberry; occasional low, stoloniferous shrub in rocky areas, on roadsides, and hedgerows.
A. interior E. L. Nielsen; Serviceberry; occasional clonal shrub in overgrown, sandy fields.
A. laevis Wiegand; Smooth Shadbush; occasional small tree in deciduous forest openings, on edges, and in fencerows.
A. sanguinea (Pursh) DC.; Round-leaved Serviceberry; EEW 2336, EEW 2398 MICH; occasional small shrub or small tree in deciduous forest openings, on edges, in fencerows, old fields, on rocky areas, and in Tea Kettle Limestone Glade.
Comarum palustre L. (*Potentilla palustris*); Marsh Cinquefoil; occasional in fens and swampy deciduous forests.
Crataegus succulenta Link var. *macracantha* (Loud.) Eggl.; Hawthorn; common in old fields and hedge rows.
Dasiphora fruticosa (L.) Rydb. (*Potentilla fruticosa*); Shrubby Cinquefoil; common on wet, rocky shores, alvars, and in fens.
Drymocallis arguta (Pursh) Rydb. (*Potentilla arguta*); Tall Cinquefoil, Prairie Cinquefoil; EEW 2336, EEW 2398 MICH; first Cockburn collection on April 6, 2012; found in partially overgrown field at the edge of an *Acer saccharum/Quercus rubra* woods at the northwest edge of Matthews Field.
Fragaria virginiana Mill.; Wild Strawberry; common in old fields, on roadsides, in grassy and stony areas, and on shores.
Geum aleppicum Jacq.; Yellow Avens; common in wet deciduous forests, clearings, and on roadsides.
G. canadense Jacq.; White Avens; occasional in wet areas in deciduous forests.

G. rivale L.; Purple Avens; occasional in marshes, fens, wet meadows, cedar swamps, and wet deciduous woods.

**Malus pumila* Mill.; Apple; common on roadsides, and in old orchards, hedgerows, on shores, and in deciduous forest openings.

Physocarpus opulifolius (L.) Maxim.; Ninebark; common in rocky and gravelly areas, especially on shores.

Potentilla anserina L.; Silverweed; common on marly shores, in fens, on grassy areas, and in wet roadside ditches.

**P. argentea* L.; Silvery Cinquefoil; common in old fields and grassy areas.

P. norvegica L.; Rough Cinquefoil; common on roadsides, in disturbed areas, and on shores.

**P. recta* L.; Rough-fruited Cinquefoil; common in old fields, on roadsides, in disturbed areas, and on shores.

Prunus americana Marshall; American Plum; uncommon, with several dense thickets in an old field on the Government Farm.

**P. cerasus* L.; Sour or Pie Cherry; EEW 2338 MICH; first Cockburn collection on April 30, 2010; spreading shrub with profuse blooms by ruins of a cabin on the Indian Reserve and in scattered hedgerows.

**P. domestica* L.; Common Plum; EEW 2352 MICH; first Cockburn collection on August 28, 2010; multiple-stemmed, tall shrub on roadside through the Government Farm. Fruit collected by islanders and animals.

P. pensylvanica L. f.; Pin or Fire Cherry; common in deciduous forest edges and in hedgerows.

P. pumila L.; Sand Cherry; common on rocky and sandy shores.

P. virginiana L.; Choke Cherry; common in deciduous forests, on edges, in hedgerows and on rocky shores.

**Pyrus communis* L.; Common Pear; occasionally spreading from cultivation to old fields and roadsides. A very spiny form with small, hard fruits is occasionally found near old home sites.

Rosa acicularis Lindl.; Wild Rose; common along deciduous forest edges and in openings, on roadsides, and rocky shores.

R. blanda Aiton; Wild Rose; common on roadsides, rocky shores, and in old fields.

**R. hugonis* Hemsley; Hugo Rose; occasional fragrant, yellow-flowered cultivar persisting near old home sites.

R. palustris Marshall; Swamp Rose; occasional in open swampy areas and fens.

**R. rubiginosa* L. (*Rosa eglanteria*); Sweetbrier; EEW 2011 MICH; first Cockburn collection on October 7, 2000; occasional on roadsides and old fields; fruits eaten by partridge.

Rubus allegheniensis Porter; Common Blackberry; EEW 2349, EEW 2390 MICH; first Cockburn collection on August 25, 2010; this fruiting population is found on the road to the Indian dock, there is a one-acre site along the14th Concession Road that has flowered but not set fruit in the past four years, and a few scattered fruiting localities along the Cross-over Road.

R. canadensis L.; Dewberry; EEW 2393 MICH; first Cockburn collection on June 22, 2012; known from one site along a sandy roadside.

R. flagellaris Willd.; Northern Dewberry; EEW 2391, EEW 2394 MICH; first Cockburn collection on June 20, 2012; known from one site along a sandy roadside.

R. parviflorus Nutt.; Thimbleberry; rare in deciduous forest openings and along roadsides, including the Sand Hills Trail.

R. pubescens Raf.; Dwarf Raspberry; common in damp areas in deciduous and cedar swamps.

R. strigosus Michx.; Wild Red Raspberry; common in old fields, hedgerows, on rock shores, and in deciduous forest openings (especially after logging).

Sorbus decora (Sarg.) C.K. Schneid.; Mountain-ash; occasional in deciduous forest openings and edges, on rocky shores, and in hedgerows.

Spiraea alba Du Roi; Meadowsweet; EEW 2367 MICH; first Cockburn collection on July 10, 2011; uncommon in marshy area along side of the Cross-over Road and scattered in other marshes.

RUBIACEAE (Madder Family)

Galium aparine L.; Annual Bedstraw; occasional in deciduous forests and disturbed areas.

G. asprellum Michx.; Rough Bedstraw; "(a) raw plant of swampy thickets and woods" (Morton and Venn, 2000). It has not been found since.

G. boreale L.; Northern Bedstraw; rare in "open forest regrowth at Rickett's Hbr." (Morton and Venn 2000). It was not found during the current study.

G. trifidum L.; Small Bedstraw; occasional in swamps, wet ditches, marshes, on beaver dams, and lake shores.

G. triflorum Michx.; Fragrant Bedstraw; common in deciduous and coniferous woods, *Thuja occidentalis* swamps, fens, and on shores.

Houstonia canadensis Roem. & Schult.; Bluets; occasional on rocky shores.

Mitchella repens L.; Partridge-berry; occasional in beech-maple forests, especially in slightly damp areas.

SALICACEAE (Willow Family)

**Populus alba* L.; White Poplar; planted around old homesteads and occasionally suckering.

P. balsamifera L.; Balsam Poplar; common in damp, deciduous forests, damp hollows, and in cut-over areas. Town lawns regenerate with young saplings, if the lawns are not kept mowed.

P. grandidentata Michx.; Large-toothed Aspen; common in sandy mixed forests and in cut-over areas.

**P. nigra* L.; Lombardy Poplar; planted along the shore of Otter Bay and around old homesteads, with occasional suckering.

P. tremuloides Michx.; Quaking Aspen; common in deciduous forests and thriving in poor or disturbed soils.

Salix bebbiana Sarg.; Bebb's Willow; common in marshes, wet ditches, and on shores.

S. candida Willd.; Sage Willow; common in fens and on shores.

S. cordata Michx.; Sand-dune Willow; EEW 2287 MICH; occasional in sand dunes on the Lake Huron shore. A clone with both male and female flowers on the same plant grows on Sand Bay east of the township park.

S. discolor Muhl.; Pussy Willow; common on shores, in swamps, marshes, and wet roadside ditches.

S. exigua Nutt.; Sandbar Willow; common in damp, sandy roadside ditches and on shores.

**S. fragilis* L.; Crack Willow; occasionally planted and spreading along shores.

S. humilis Marshall; Upland Willow; occasional in openings in deciduous or mixed forests and on rocky shores.

S. lucida Muhl.; Shining Willow; common in roadside ditches, marshes, and on shores.

S. myricoides Muhl.; Blueleaf Willow; occasional on sand dunes.

S. petiolaris Sm.; Slender Willow; occasional in marshes, swamps, roadside ditches, and on shores.

S. serissima (L. H. Bailey) Fernald; Autumn Willow; occasional in swamps and on shores.

SANTALACEAE (Sandalwood Family)

Arceuthobium pusillum Peck; Dwarf Mistletoe; locally abundant on *Picea glauca* on the roadside along Sand Bay.

Comandra umbellata (L.) Nutt.; Bastard-toadflax; common in grassy areas, open, deciduous forests, and on shores. It is hemiparasitic and an alternate host to a rust fungus that occasionally affects *Pinus banksiana* (Jack Pine).

Geocaulon lividum (Richardson) Fernald; Geocaulon; occasional in open, dry, deciduous forests, along edges, and stable portions of dunes. Parasitic on various species of gymnosperms and angiosperms.

SAPINDACEAE (Soapberry Family) [ACERACEAE]

Acer pensylvanicum L.; Striped Maple; occasional in deciduous and mixed woods.

A. rubrum L.; Red Maple; uncommon in wet thickets, on roadsides, and in sandy woods.

A. saccharinum L.; Silver Maple; uncommon in swampy forests.

A. saccharum Marshall; Sugar Maple; abundant in deciduous woods.

A. spicatum Lam.; Mountain Maple; common in deciduous and coniferous woods and roadsides.

SARRACENIACEAE (Pitcher-plant Family)

Sarracenia purpurea L.; Pitcher-plant; occasional in fens and bogs, even in shade.

SAXIFRAGACEAE (Saxifrage Family)

Mitella nuda L.; Naked Miterwort; common in *Thuja occidentalis* swamps and mixed forests, especially on mossy logs.

SCROPHULARIACEAE (Figwort Family)—see also Oobanchaceae, Phrymaceae, and Plantaginaceae

**Verbascum thapsus* L.; Mullein; common on roadsides, in gravel pits, on shores, and in disturbed areas.

SOLANACEAE (Nightshade Family)

Leucophysalis grandiflora (Hook.) Rydb.; White-flowered Ground-cherry; occasional in disturbed sandy, gravelly, or rocky areas. Area must continue to be disturbed (naturally or by man) or the plant dies out within two or three years.

Physalis heterophylla Nees; Clammy Ground-cherry; occasional in disturbed areas, old fields, and the dump; also found within a year or two in previously wooded areas after logging, especially in former logging staging grounds.

THYMELAEACEAE (Mezereum Family)

Dirca palustris L.; Leatherwood; occasional in deciduous forests and along forested roadsides, and at the edges of gravel pits, especially in rich moist areas.

TILIACEAE—see Malvaceae

URTICACEAE (Nettle Family)

Laportea canadensis (L.) Wedd.; Wood Nettle; rare in damp forests.

Urtica dioica L.; Stinging Nettle; common in disturbed nitrogen-rich soil.

VALERIANACEAE (Valerian Family)

Valeriana uliginosa (Torr. & A. Gray) Rydb.; Swamp Valerian; "Collected in 1959 by Dr. Soper in a spruce-tamarack bog 5 mi SW of Tolsma Bay…" (Morton and Venn 2000). It was not found during the current study.

VERBENACEAE (Vervain Family)

Verbena hastata L.; Blue Vervain; occasional in beaver swamps and swampy forest openings.

VIOLACEAE (Violet Family)

Viola adunca Sm; Sand Violet; sight records by NHIC team in 2003 and 2014 on shoreline of Wagosh Bay.

V. blanda Willd.; Sweet White Violet; common in damp areas in coniferous and mixed forests.

V. canadensis L.; Canada Violet; occasional in heavy (clay) soil in deciduous forests.

V. labradorica Schrank *(V. conspersa*); Dog Violet; common in grassy or rocky places, forested areas, and along slightly disturbed trails and ditches.

V. macloskeyi F. E. Lloyd; Smooth White Violet; occasional in bogs and damp areas in forests.

V. nephrophylla Greene; Northern Bog Violet; common on shores, damp forest edges and in openings, wet ditches and grassy areas.

V. pubescens Aiton; Yellow Violet; common in deciduous and mixed forests.

V. renifolia A. Gray; Kidney-leaved Violet; common in coniferous forest swamps.

VISCACEAE—see Santalaceae

VITACEAE (Grape Family)

Parthenocissus quinquefolia (L.) Planch.; Virginia Creeper; rare along fencerows in mid-island. Combined with *P. inserta* as *P. vitacea* in Morton and Venn (2000) and not seen since.

Vitis riparia Michx.; River-bank Grape; occasional along fencerows and in open deciduous woods and thickets.

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Refer to http://quod.lib.umich.edu/m/mbot/submit for more detailed instructions, especially for formatting, style conventions, literature cited, and voucher specimen requirements. Please contact the editor with any questions.

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5. Send each figure as a separate file in a high-resolution format—eps, jpg, or tif. Figures like bar graphs that gain their meaning with color won't work—use coarse-grained cross-hatching, etc. Create figure legends as a separate text file, and the typesetter will insert them as appropriate. Please do not insert the figure in the body of the text file.

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On the cover: Cockburn Island, Ontario. Limestone bedrock lakeshore south of the Indian Dock on the False Detour Passage, which separates Cockburn Island from Drummond Island in Michigan. Photo by Ellen Weatherbee